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AUTHOR Bridgeman, Brent; And Others
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ABSTRACT

This report presents the results of a data analysis designed to determine (1) the relationship of measures of self-esteem and achievement motivation obtained in the Head Start year, kindergarten, and first grade to reading and mathematics achievement in the third grade, and (2) whether such measures can improve predictions made solely from a preschool achievement measure. The data analyzed for this report came from the Educational Testing Service Head Start Longitudinal Study, and in keeping with the aims inherent in the longitudinal study, particular focus was on the relationship of these findings to the child's attendance or non-attendance in Head Start and the extent of differential prediction for Head Start children of varying characteristics. A total of 467 children comprised the sample with four subsamples identified: (1) northern urban black Head Start, (2) sourthen rural black Head Start, (3) urban black with no preschool, and (4) rural middle-socioeconomic status white with non-Head Start preschool. The results are presented in detail and implications for preschool and elementary programs and future research are discussed. (JMB)

PR 75-24

DISADVANTAGED CHILDREN

AND THEIR FIRST SCHOOL EXPERIENCES

ETS-Head Start Longitudinal Study

Predictive Value of Measures of Self-Esteem and Achievement Motivation in Four- to Nine-Year-Old Low-Income Children

Brent Bridgeman and Virginia C. Shipman

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Brent Bridgeman
Virginia C. Shipman

Princeton, New Jersey
October 31, 1975

Chapter 1

INTRODUCTION

Standard preschool achievement tests have been found to be only somewhat predictive of later academic performance. Since a child's school performance is influenced not only by what he knows but by his attitudes and motives, consideration of variables from the affective domain (e.g., achievement motivation, self-esteem) might improve predictions of academic success. If such variables were found to be important predictors, either by themselves or in interaction with other variables, they might be valuable in the early identification of children likely to experience difficulties in academic achievement. Furthermore, more complete knowledge of the relationship of these affective-social variables to later school achievement might help guide the implementation of Head Start and other preschool programs designed to facilitate later achievement by encouraging the child's development in these areas. For example, the finding that individual differences in early measures of self-esteem are predictive of later academic achievement would provide additional support for increased and systematic efforts to raise self-esteem. Similarly, a preschool program that claimed it was successful because it increased children's achievement motivation might be considered truly successful only if measured achievement motivation could actually be shown to predict subsequent achievement.

Since preschool children's performances on achievement measures are themselves influenced by affective states of the child while taking the test (Zigler & Butterfield, 1968), it is unclear whether independent assessment of relevant affective variables would increase predictions to later achievement. One would expect such independent predictions for newly emerging affective

feelings that have not had an opportunity to influence the early achievement scores. Indeed, a number of investigations report significant incremental validities for affective measures over what could have been predicted solely from aptitude or achievement tests (e.g., Cattell, Barton & Dielman, 1972; Khan, 1969). Nearly all such studies, however, involve children from the third grade level or beyond.

There is some research, however, which assesses the ability of measures of self-esteem at the preschool or kindergarten level to predict later school achievement. One example is a study by Wattenberg and Clifford (1964), who related ratings of self-concept made at the beginning of kindergarten with reading test scores two-and-a-half years later. Self-concept scores were obtained from judges' ratings of tape-recorded remarks made by children while drawing pictures of their families and responding to a specially constructed incomplete sentences test. For their measure of self-esteem (Quantified Self-Concept [Good-Bad]), significant predictions to the reading score (at the .05 level, one-tailed) were found in only four of the fourteen subgroups in their analysis; the magnitude of the correlations was not reported. Ozehosky and Clark (1970) found higher kindergarten achievement (Metropolitan Readiness Test) in a group of children rated high in self-esteem than in a low rated group. However, the criterion groups were extreme (the highest and lowest 50 children out of an initial sample of 1042) and the relationship or lack of relationship for the majority of the children is therefore unknown.

Research relating early indicators of achievement motivation to actual early elementary school achievement also has been very limited, due largely to a lack of adequate measuring instruments of early motivation. Assessment procedures that work well with older children and adults may not be feasible or

valid with young children.. Even with a group of first through third grade children that was well above average in intelligence, a TAT measure of n achievement was found to have no relationship to subsequent measures of achievement (Crandall, Katkovsky & Preston, 1962). Of the five other motivation-related variables in that study, the only one significantly related to reading achievement was the Children's Intellectual Achievement Responsibility Questionnaire, and then only for boys. The issue of incremental validity was not discussed. One attempt to assess achievement motivation directly in preschool and kindergarten children is an objective-projective technique known as Gumpgookies that is designed to elicit choices between alternative behaviors that reflect differences in motivation (Adkins & Balliff, 1970). While the authors provide some evidence of concurrent validity, evidence on predictive validity is lacking. A commercial version of Gumpgookies, Animal Crackers, is currently being nationally marketed in a "research edition," although no information is yet available on its ability to predict school achievement.

Another approach to the assessment of affective and social functioning in young children is the use of teacher or observer ratings. For example, Kohn and Rosman (1974) found that kindergarten teacher ratings of two hundred and nine lower- and middle-class boys on three social-emotional variables (Apathy-Interest, Anger-Cooperation, and Task Orientation) were significantly related to achievement in second grade, especially for the Task Orientation score. However, when kindergarten measures of cognitive functioning were included first in the prediction equations the affective-social variables did not significantly add to predictions of arithmetic or word knowledge, and contributed only an additional 3% of the variance

for predictions of reading achievement. Pusser and McCandless (1974), with a longitudinal sample of economically disadvantaged children, used a number of factor analytically-derived "socialization dimensions" to predict achievement at the end of second grade from data obtained while the children were in pre-kindergarten classes. After entering scores from the verbal facility factor in a multiple regression, a factor called "coping with anxiety by aggression" contributed significantly to the multiple correlation for girls. This factor was defined largely by the preschool teacher's rating of aggression. For boys, only the "alienation" factor added significantly to the prediction. High loadings on this factor were from the children's Self-Social Constructs test (Long & Henderson, 1968).

Previous investigations of the relationship of affective-social behaviors to later academic performance were necessarily limited by the lack of a longitudinal data base that was relatively comprehensive with respect to children sampled or variety of measures included. For example, Kohn and Rosman's (1974) sample was limited to boys living in New York City, and possible sex or location differences obviously could not be discussed. Further, Kohn and Rosman's affective-social measures were limited to teacher ratings, and more direct measurement of these variables was not attempted. Pusser and McCandless (1974), with their sample limited to low-income Atlanta children, had no measure of achievement motivation either from an individual child test or from teacher ratings.

The ETS-Head Start Longitudinal Study provides a relatively comprehensive data base for investigating this question. Since in the Longitudinal Study an attempt was made to assess the same variable by a variety of techniques,

different ways of measuring the same trait can be contrasted and compared. Thus, for example, teacher ratings and self-reports of achievement motivation can be compared, the amount of overlap in the two assessment techniques noted, and the relative predictive efficiency of the two techniques explored. The predominant, though not exclusively, low-income sample of both boys and girls from urban and rural areas permits the investigation of the affective and social predictors of academic achievement in a group that historically has had serious problems in the school achievement area.

For the current report, then, data from the ETS-Head Start Longitudinal Study were analyzed to determine (1) the relationship of measures of self-esteem and achievement motivation obtained in the Head Start year, kindergarten, and first grade to reading and mathematics achievement in the third grade, and (2) whether such measures can improve predictions made solely from a preschool achievement measure. A criterion measure of problem-solving ability also was included in order to investigate possible differential predictions when compared to the more directly school-oriented achievement measures. Given the aims inherent to the Longitudinal Study, particular focus was on (1) the relationship of these findings to whether the child attended Head Start and (2) the extent of differential prediction for Head Start children of varying characteristics.

Since Head Start was a kindergarten-level program in the one rural study site (Lee County) and a prekindergarten program in the two urban study sites (Portland and Trenton), all analyses were run separately in the urban and rural sites. In addition to these major predictive analyses that investigated relationships for those children who actually attended Head Start classes,

supplementary analyses contrasted relationships within the Head Start sample to relationships for children who had not attended Head Start. In the urban sites this comparison group consisted of children who, as far as could be determined, had not attended any preschool program. Due to the success of the Lee County Head Start program in enrolling eligible children, there were too few children in that site with no preschool experience to allow meaningful comparisons. However, there were a number of middle-class white children in Lee County who attended non-Head Start preschool programs. While differential patterns of correlation for this group compared to the Head Start group are of interest, it is impossible to determine whether such differences are caused by the Head Start experience itself or by other processes associated with SES/race differences. Since previous research suggested the existence of sex differences in both mean level comparisons and patterns of intercorrelations, analyses at each step were performed separately by sex.

The current analysis also investigated the possibility that certain child characteristics interact with measures of self-esteem and achievement motivation in predicting third grade achievement. Specifically, this set of analyses was designed to determine whether differential predictions from the self-esteem and achievement motivation scores in the Head Start year would be found for children with different entry characteristics (cognitive level, response tempo, cooperativeness) assessed in the spring prior to Head Start entrance.

In subsequent chapters of this report the following are discussed: Chapter 2, the sample; 3, data collection and processing procedures; 4, measures selected, and 5, relationship of affective and social measures to cognitive-

perceptual performance within and across time periods. In Chapter 6 the findings are summarized and their implications for program planning, evaluation, and future research discussed. To aid interpretation of the findings, within-domain analyses (e.g., correlations among the various indicators of self-esteem) and information on the across-year stability of the measures used in this report are included in an appendix.

Chapter 2

SAMPLE

The sample for the current report is a subsample from the ETS-Head Start Longitudinal Study. Sample selection procedures and initial sample characteristics for the Longitudinal Study are presented in PR-71-19 (Shipman, 1971). Briefly, in the fall of 1968 four regionally distinct communities were selected which (1) had sufficient numbers of children in grade school and in the Head Start program, (2) appeared feasible for longitudinal study given expressed community and school cooperation and expected mobility rates, and (3) offered variation in preschool and primary grade experiences. The study sites chosen were Lee County, Alabama; Portland, Oregon; St. Louis, Missouri; and Trenton, New Jersey. Within these communities, elementary school districts with a substantial proportion of the population eligible for Head Start were selected. In each school district an attempt was made to test all nonphysically-handicapped, English-speaking children who were expected to enroll in first grade in the fall of 1971 (i.e, children of approximately 3 1/2 to 4 1/2 years of age).

In 1969 mothers were interviewed and children tested prior to their enrollment in Head Start or any other preschool program. For this initial four-site sample at least partial data were obtained on a total of 1875 children, with Lee County and Portland constituting 60% of the sample. Sixty-two percent of the sample was black, with boys comprising 53% of the overall sample, 54.5% of the black sample, and 50.5% of the white sample. For the three sites in which children had the opportunity to attend Head Start in the second year of the study (1969-1970), 37.2% of the sample attended Head Start, 11% attended other preschool programs, and 51.8% had no known attendance in Head Start or other preschool programs. In Lee County,

where Head Start was a kindergarten program, 41.7% of the initial sample attended Head Start, 19.1% attended other preschool programs, and 39.9% had no known attendance in Head Start or other preschool programs. While racial composition of the Head Start sample varied by site, substantially more blacks than whites attended Head Start; only 13.3% of the children enrolled were white. For a variety of reasons, the St. Louis site was dropped in the third year of the study and the 353 subjects there lost from further longitudinal study. By the end of the fourth year of the study in June 1972, the longitudinal sample consisted of 1086 children in three sites. In June of 1974, the six-year longitudinal sample contained 1017 children in three sites. Thus, except for the loss of St. Louis, attrition over six years was limited to about one-third of the original sample, with losses distributed equally across sexes and sites, but relatively greater for whites in each site. The six-year longitudinal sample went from 62% to 72% black across sites.

The current analysis focused on children from the longitudinal sample who had complete data and valid scores on Year 6* Cooperative Primary Tests plus at least one of the relevant measures from the first four years of the study. The Cooperative Primary Tests were group administered only in "target" classrooms (i.e., classrooms containing 50% or more children who had been previously tested). Some longitudinal children, though located

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*Throughout the report "Year" refers to year of the Longitudinal Study. Year 1 = 1969 (child age 3 1/2-4 1/2); Year 2 = 1970 (child age 4 1/2-5 1/2); Year 3 = 1971 (child age 5 1/2-6 1/2); Year 4 = 1972 (child age 6 1/2-7 1/2); Year 6 = 1974 (child age 8 1/2-9 1/2). For the measures in this report, testing was conducted in the spring of the year. The Schaefer Classroom Behavior Inventory, which teachers completed, was obtained in the fall of Year 4 and in the spring of Year 6.

for individual testing, were no longer in target classrooms and therefore were excluded from the sample for the current analysis. In addition to simply moving out of the district, the most frequent reasons for no longer being in target classrooms were failing or skipping a grade, enrollment in a private/parochial school, and, in Portland, exercising the option available there to be bussed to a different elementary school.

Given the similarity of preliminary findings for Portland and Trenton, data from these two sites were pooled to form a combined urban/northern sample. Lee County is a basically rural southern county in which Head Start was a Kindergarten level program, rather than a pre-kindergarten program as it was in the urban sites. Therefore, Lee County was treated separately in all analyses. For simplicity of presentation, Portland and Trenton are referred to as the urban sites and Lee County is referred to as the rural site; however, the reader should remember that Lee County differs from Portland and Trenton in more than just its level of urbanization. A description of the three sites may be found in PR 69-12 (ETS, 1969). Due to the small number of white children with the necessary scores who had attended Head Start and the fact that this small group of white children had somewhat different background characteristics, they were excluded from the sample for this report. For the same reasons, the subgroups for the supplementary analyses were made homogeneous with respect to race. Thus, white children were excluded from the "No Preschool" group, while black children were excluded from the "Other Preschool" group. In the urban sites, the "No Preschool" group consisted of study children for whom local study coordinators could find no evidence of attendance in any nursery school or day care program

during 1969-70 (i.e., the year before kindergarten entrance). It is possible, however, that a few children in this category actually attended preschool. In Lee County the "Other Preschool" category includes children known to have attended preschool programs other than Head Start in 1970-71; private kindergartens were considered preschools for this classification. As noted previously, there were too few black children in the urban sites with other preschool experience and in the rural site with no preschool experience to allow for meaningful comparisons. Table 1 presents the number of children in each subgroup for the present report.

Table 1

Number of Sample Children Classified by Preschool Attendance Category, Sex, and Site

		Urban (Portland and Trenton)	Rural (Lee County)
Head Start	Boys	90	89
	Girls	77	72
No Preschool	Boys	28	--
	Girls	35	--
Other Preschool	Boys	--	41
	Girls	--	35

Note. All boys and girls in "Head Start" and "No Preschool" categories are black; all boys and girls in "Other Preschool" category are white.

Table 2 provides a description of the urban and rural Head Start samples and the two supplementary samples in terms of two indexes of socio-economic status (SES), the highest grade in school actained by the mother and the Census Bureau classification of the occupation of the head-of-household (from Professional = 0 to Laborers = 9, plus an additional category, Unemployed = 10). Since the focus of this report is on measures obtained in the early study years, these two SES indexes were obtained from Year 1 Parent Interview information. Given the absence of any significant within-group sex differences on these measures, this variable is collapsed in the table.

Table 2

Mother's Education and Head-of-Household's Occupation for Report Sample

	Mother's Education		Head-of-Household Occupation	
	M	SD	M	SD
Urban Head Start	10.39	2.25	7.51	2.35
Rural Head Start	9.32	2.38	7.31	1.78
No Preschool (urban only)	11.05	1.67	7.10	2.91
Other Preschool (rural only)	13.54	2.54	1.78	2.38

While the two Head Start samples were similar in terms of the occupation of the head-of-household, they differed significantly ($t = 3.96$, $df = 291$, $p < .01$) on the mother's education level with mothers in the urban sites averaging about one more year of schooling. In the urban sites, the mothers of the children in the "No Preschool" category averaged a little over half

a year more schooling than the mothers of the Head Start children (t = 2.31, df = 201, $p < .05$). As intended, the "Other Preschool" children in Lee County came from families of substantially higher SES levels as indexed by both SES indicators.

Chapter 3

DATA COLLECTION AND PROCESSING PROCEDURES

Individual child tests were administered by local women, most of whom were black housewives with limited work experience. While the usual educational credentials were not required, experience working with young children was considered highly desirable, as were the abilities to read well and speak with ease. In Year 1, testers were trained for 4 to 5 weeks, after which the project director and a senior member of the professional research team made final selection of testers. Testing was monitored by a local coordinator and by ETS regional and Princeton office staffs. Training procedures for testers were essentially identical in later years of the study, except that with increased experience the training period could be reduced to three weeks. In the early years of the study, test centers were located in churches or community recreation facilities, while in later years testing was done in rooms available in the individual schools or in mobile vans parked outside of the school. Each year, individual tests were grouped into two or more batteries, with each battery usually administered in a single session with a child. Each battery included measures representing the range of areas being assessed; the order of tests within batteries reflected consideration for the need to balance types of responses (active vs. passive, verbal vs. nonverbal), and to stimulate and sustain the child's interest. The sequence of tests within each battery and the average time required for administration of each individually administered task described in this report are presented in Appendix A.

Due to budgetary constraints data collection was not always uniform across sites. The most intensive testing coincided with the year of children's attendance in Head Start programs in each site. Thus, testing was limited in Lee County in Year 2 and in Portland and Trenton in Year 3. Of the measures relevant for this report, the Preschool Inventory was not administered in the urban sites in Year 3, while Gumpgookies and Eight-Block Interaction Task cooperation ratings were not administered in Lee County in Year 2. While in Year 2 Gumpgookies was administered individually, in Year 3 it was group administered in target classrooms (i.e., classes with 50% or more study children). In Year 4 the funds available permitted individual administration of Gumpgookies in both Lee County and Portland, but only group administrations in target classes in Trenton (which had been selected as the site for reduced testing in Year 4 because it contained the fewest longitudinal subjects). Both Year 4 and Year 6 Cooperative Primary Tests were group administered by the regular classroom teachers to target classes in all three sites. Local ETS staff, rather than the children's teachers, administered the Coopersmith Self-Esteem Inventory to all third-grade target classrooms in order to enhance the child's feeling of confidentiality in the information obtained.

In addition to data from child tests, information was obtained from ratings of study children and their classmates in target classrooms at the beginning (and in Year 6, end) of the school year with the Schaefer Classroom Behavior Inventory. The local site coordinator explained the procedures for group testing and student ratings to each teacher and was available to assist the teacher as necessary; a small honorarium was paid to teachers for their assistance.

The data from all of the above measures were coded at the item level by Princeton office staff, and all coding was double-checked. The coded data were keypunched and independently verified, after which the individual data tapes were edited for appropriate ID listing and for out-of-range and/or logical inconsistencies in coding. For more detailed description of data collection and analysis procedures see Project Report 72-18 (Shipman, 1972).

Chapter 4

MEASURE DESCRIPTION

In this chapter a brief description is provided for those measures from which data were selected for the present analysis. The affective and social measures included are presented first, grouped according to whether they purport to index primarily self-esteem or achievement motivation. Year 6 measures not used in the predictive analyses, but used in the supplemental analyses reported in the appendix, also are described in this section. Measures of cognitive-perceptual functioning, including academic skills and less directly school-related reasoning and problem-solving abilities, are described in the next section, followed by a description of the measures that were used as potential moderator variables in tests for differential predictions according to initial status on those variables.

Measures of Self-Esteem

Brown IDS Self-Concept Referents Test (and the ETS Revised Form). This task attempts to assess the child's attitudes and feelings about his general ability, appearance, physical status, affective tone, and fears. A full-length color Polaroid photograph of the child is taken, and after the tester verifies that the child recognizes himself in the picture the child is asked to respond to 14 bipolar items (e.g., "Is (child's name) happy or is he/she sad?"). After the 14 items are administered, the child is asked to respond to the same items again; this time answering as he thought his teacher would respond in describing how he felt. Thus, the task attempts to relate the child's perception of "self-as-subject" to his perception of "self-as-object." A fifteenth item asking the child if he

did or did not have a lot of friends was added, but since it was not part of the original test, it was omitted from the total score.

The Brown was administered in Years 1, 2, 3, and 4, although in Year 1 no teacher-referent items were included and in Year 2 these items were administered only to children attending a preschool. Since Brown had developed this measure for use with four-to-six-year-olds, for Year 6 testing the Brown was extensively revised by replacing six of the original items with new items and revising the format of the response alternatives. Mother referent, rather than teacher referent, was used so that the child's perceptions of what the mother thought could be studied in relation to actual statements by the mothers in the parent interviews that were conducted in Year 6. A number of children in Year 4 had difficulty choosing either bipolar extreme on many of the items because their true feelings were somewhere in between, or varied over situation and time. In order to permit these intermediate values, the Year 6 revision contained a four-point rating scale for each item (e.g., "Do you think you are ___very good looking, ___pretty good looking, ___a little bit good looking, or ___not so good looking?"). The wording of certain items also was modified in order to avoid some of the extremely negative alternatives from the bipolar format. For example, "not so good looking" was substituted for the bipolar choice "ugly." Thus while this self-concept referent task was adapted from the earlier versions, it was sufficiently different for "Brown IDS" to be dropped from its title. Each item was scored on a four-point scale such that high scores would reflect a positive self-concept (minimum score = 14 [14 x 1]; maximum score = 56 [14 x 4]).

School Perception Interview, Item 21. The purpose of this interview, which was specifically developed for the Longitudinal Study, is to determine the child's perceptions (i.e., his thoughts, feelings and opinions) of life in school; it is not intended to represent objective "truth" about the school or classroom. While the entire interview contained 21 items of both the open- and closed-ended type, only Item 21 was used in this report as a measure of self-esteem. (Item 1 was used also, but as an indicator of achievement motivation.) In Item 21 four stick figures printed on a page are shown to the child. The tester explains that the first one is doing "very good work in school," the second one "pretty good work," the third "not too good work," and the fourth "very bad work in school." The child is asked to point to the one "most like you." The responses were scored in the direction of high scores indicating positive self-perceptions. The interview was administered in Years 4 and 6 of the study.

Coopersmith Self-Esteem Inventory (CSEI). This instrument was designed to provide a general index of the child's feeling of self-worth and self-esteem (Coopersmith, 1967). After the tester reads the item, the child is asked to make a mark on his answer sheet after either "like me" or "unlike me." The items include such statements as "I'm proud of my school work," and "I often feel upset in school." The version of the CSEI used in the Longitudinal Study contained 42 items. Due to the relative complexity of the items, it was not administered until Year 6 of the study.

Measures of Achievement Motivation

Gumpgookies. Gumpgookies consists of dichotomous items designed to measure academic achievement motivation (Adkins & Ballif, 1970; Adkins, Payne

& Ballif, 1972). It was developed from a model that assumed five components of achievement motivation "(1) an affective component, expressed as positive affect from achievement; (2) a conceptual component, whereby the individual sees himself as an achiever; (3) a purposive component, enabling the individual to establish and respond to future goals; (4) a cognitive component, by means of which the instrumental steps necessary to attain goals are known; and (5) an ethical component, through which the individual can evaluate his own performance (Adkins & Ballif, 1970, p.138)." The child is told that he has his very own imaginary figure called a Gumpgookie that shares his feelings and behaves exactly as he does. Each item shows two Gumpgookies engaged in different activities or having different attitudes (e.g., "This one likes to learn. This one likes to play all the time."), and the child is asked to pick which Gumpgookie is his. For each item, the response indicating greater motivation to achieve in school was predetermined by agreement among a group of judges.

A 75-item version was used in Years 2 and 3. In Year 4 it was replaced by a new 60-item version wherein items having low biserial correlations with total test score in the Year 3 Longitudinal Study data and in Adkin's Head Start sample (Adkins, 1971) were eliminated. Achievement responses from both versions were equally distributed with respect to primacy-recency, right-left, and up-down orientation.

School Perception Interview, Item 1. Item 1 of the School Perception Interview also relates to achievement motivation, specifically the affective component of achievement motivation mentioned above. In Year 4 Item 1 stated, "Some kids like school a lot, other kids don't like school very

much. How much do you like school?--very much, a little bit, or not so much?" In Year 6 an additional response choice was added to permit more variance in responses. The modified choices were, "very much, pretty much, a little bit, or not at all?" Both versions of the items were scored in the direction of high scores indicating favorable attitudes toward school.

Schaefer Classroom Behavior Inventory (CBI)--Task Orientation Score. The Classroom Behavior Inventory was initially developed by Schaefer, Droppleman, and Kalverboer (1965) based on Schaefer's (1961) circumplex model of child behavior. Factor analyses of a number of different versions of the CBI on a variety of populations have consistently revealed three major bipolar dimensions: Extraversion, Hostility, and Task Orientation (Schaefer, 1975). The latter score, which is defined as perseverance and concentration, is considered in this report as an indication of the child's achievement motivation as perceived by the teacher. The short form of the CBI used in the Longitudinal Study consists of five unipolar items representing each dimension. In this version (Schaefer, Aronson & Small, 1970) the child's teacher is asked to rate the frequency of occurrence of 15 behaviors (e.g., "Stays with a job until he finishes it.") on a five-point score from "almost never" to "almost always." CBI scores for both first grade (Year 4) and third grade (Year 6) were analyzed for the current report.

Measures of Academic Achievement

Preschool Inventory (PSI). The PSI, developed by Caldwell for use in Project Head Start as a general achievement test for preschool children, taps a range of verbal, quantitative, and perceptual-motor skills defined by teachers as expected of children in kindergarten. The items for the

present 64-item revision are classified in the Inventory Manual (ETS, 1970) into four major categories: Personal-Social responses (18 items, e.g., "How old are you?", "Raise your hand."); Association Vocabulary (12 items, e.g., "What does a dentist do?"); Concept Activation--Numerical (19 items, e.g., "How many wheels does a car have?"); Concept Activation--Sensory (19 items, e.g., "Which is heavier, a brick or a shoe?"). However, the Inventory Handbook (ETS, 1970) advises against the determination of subset scores, and factor analyses of Longitudinal Study data and Head Start Planned Variation Study data (Walker, Bane & Bryk, 1973) have not supported their use. About 60% of the items require an oral response. The PSI has been widely administered to Head Start children (e.g., Research Triangle Institute, 1972; Walker, Bane & Bryk, 1973). Statistical information on the standardization sample for the 1970 Revised Edition (64-items) is contained in the Handbook. Since child testing in Year 1 occurred throughout the spring and summer of 1969, and since at this age performance level on the PSI was known to improve noticeably even over a period of a few months (Shipman, 1972), age at time of testing was partialled out of the scores to yield an age-corrected PSI score. By Year 2 age at time of testing was not significantly correlated with total score, and this correction was no longer necessary.

In the factor analysis of the individual child test data in Years 1 and 2, performance on the PSI had the highest loading on the first factor, which appeared to represent general cognitive ability, and it is the single task in the Longitudinal Study battery most clearly associated with general cognitive development. Thus, the PSI was selected for the current report to function as a covariate so that the unique contribution of affective-social

variables to predictions of later cognitive-perceptual functioning could be determined. From a practical point of view, it was important to determine whether including the affective-social measures described in this report in a test battery could significantly improve predictions over what could have been predicted from the PSI alone. And from a theoretical standpoint, it was desired to determine whether the affective-social measures shared any variance with later cognitive-perceptual measures that was independent of the variance that they initially shared with the PSI.

Cooperative Primary Tests--Reading. The Cooperative Primary Tests are a national standardized achievement test battery developed by ETS and designed for use in first through third grade. The tests are group administered, with the child responding by making an "X" on the one of the three response alternatives that he believes is correct. There is no special instruction to the student about guessing, and there is no correction for guessing in the scoring. The teacher is instructed to allow a reasonable amount of time for all students to finish. In order to provide practice with this type of item, the pilot test included in the test package was administered first in both Year 4 and Year 6 testing. Form 12A of the Cooperative Primary Tests was given in the first grade, while Form 23B was administered in third grade (Year 6). Both forms of the Reading test consist of 50 items, some of which assess the comprehension of individual words, while others require the student to extract a key element from a sentence or paragraph, or provide some interpretation, evaluation, or inference based on the sentence or paragraph (Cooperative Primary Tests, ETS, 1967).

Cooperative Primary Tests--Math. Form 12A of the Math test consists of 55 items, while Form 23B contains 60 items. In both forms the following

topics are covered: number, symbolism, operation, function and relation, approximation, proof, measurement, estimation, and geometry. Straight computation is not emphasized, but rather an attempt is made "...to test major concepts of mathematics in their emergent state" (Cooperative Primary Tests, ETS, 1967).

Measure of Problem-Solving Ability

Raven Colored Progressive Matrices (booklet version): Developed for use with young children and retarded or impaired adults for whom the standard series of Progressive Matrices is inappropriate, the Colored Progressive Matrices contains 36 items divided into three sets of increasing difficulty (A, Ab, and B). Each item represents a pattern with a piece missing; the child is asked to select (from a set of six alternative pictures) the piece that correctly completes the pattern. Compared to the measures listed above, this task is more a measure of problem-solving ability and less a measure of specific school learning. It assesses the individual's ability to make perceptual discriminations, to compare, and to reason by analogy. It is also a kind of learning-to-learn task in that the child who learns efficient strategies on the beginning relatively easy items will have greater success as the items become increasingly difficult. This test was individually administered in both Year 4 and Year 6.

Moderator Variables

Measures of three distinct child characteristics (cognitive skill, response tempo, and cooperativeness) were used in the current report in order to investigate the possibility that Head Start entry level status on these characteristics interacts with the measures of self-esteem and

achievement motivation in predicting third grade achievement. Cognitive skill and response tempo were considered important since they had previously been shown to be related to the personal-social behaviors of study children attending Head Start (Emmerich, 1973), and cooperativeness with an adult in a learning situation would presumably influence the nature of the child's preschool experience and the validity of both cognitive and social-affective scores. The measure of cognitive skill was the Preschool Inventory already described above; descriptions of the measures of the other two child characteristics are presented below.

Response Tempo. After the first general information-processing factor in the Year 1 factor analysis (Shipman, 1971) came a second factor apparently representing a response tempo dimension. It was best represented by mean latency scores on the Sigel Object Categorizing Test and the Matching Familiar Figures Test (MFF). With oblique rotation the correlation between the first two Promax factors was only -.16, thus for this sample in this age period response tempo was not related to general information-processing skills. Nevertheless, since both the Brown and Gumpgookies represent tasks in which the child must consider two response alternatives before making a meaningful choice, a measure of response latency might act as a moderator in predictions from scores on these two instruments.

Since MFF was the only measure of response tempo which was administered in both the urban and rural sites in the year prior to Head Start attendance, it was selected as the response latency measure for this report. The version of the test used in the Longitudinal Study was developed by Lewis, Rausch, Goldberg, and Dodd (1968), and used by them with middle-class three-year-olds. The test consists of two practice and eighteen test items. On each

item the child is shown a standard and four comparison figures, one of which is identical to the standard. All figures are simple line drawings of animals, people, common objects, or geometric designs. The child is first shown the set of comparison figures and asked to look at each figure in turn. He is then given the standard and asked to point to the one comparison figure that is identical to it. Latency is defined as the amount of time from the presentation of the standard until the child points. Since latency scores were positively skewed, they were transformed by log (X+1) before averaging. In Year 1 very large latencies (over 20 seconds) were reduced to an arbitrary value of 20 seconds before the log transformation was applied. Since this applied to only .1% of all responses it was actually unnecessary, and was not repeated with Year 2 data. The score used in the current report was this transformed latency averaged over the eighteen items.

Cooperation Rating. The Cooperation Rating Scale from the Fels Behavior Rating Scales (Baldwin, Kalhorn, & Breese, 1949) was used to characterize the child's cooperation during the Hess and Shipman Eight-Block Mother-Child Interaction Task. It provides a useful index of the degree to which the mother has to motivate or control in addition to teaching the material. The rating is based solely on the child's behavior; the actions of the mother or the child's success and failure in the task-specific responses are not to be considered. (Of course, such factors are likely to influence the child's behavior and thus be indirectly represented.) Ratings are on a nine-point scale from "child was fully tuned in to the mother--pliable, interested, attentive; no difficulty or conflict arose" to "child ignored the mother's teaching efforts and/or actively resisted the

task throughout the interaction." To the extent that the child's behavior with his or her mother reflects a more general ability and/or willingness to be attentive to cognitive task demands and to cooperate with a teaching adult, such behavior might act as a moderator in predictions regarding the association among other cognitive and affective measures.

Chapter 5

RESULTS AND DISCUSSION

In this chapter results are presented first for the major predictive analyses with both the urban and rural Head Start samples. Next, results are presented on the question of differential predictions depending on the child's status on selected characteristics assessed before the child entered Head Start. Finally, comparisons with the urban "no preschool" and rural "other preschool" groups are provided.

Major Predictive Analyses for the Head Start Samples

Relationship of Preschool Measures of Self-Esteem to Third Grade Cognitive-Perceptual Performance for the Head Start Sample

Since young children sometimes failed to choose either of the bipolar alternatives on the Brown IDS Self-Concept Referents Test, an adjusted self-concept score was created which was the proportion of positive responses for those items clearly answered in either a positive or negative way. The means and standard deviations of these adjusted scores are presented in Table 3.

Consistent with previous findings (Brown, 1966; Walker, et al., 1973), self-esteem scores during the age period four to six were uniformly high. Even in the year prior to entry into a Head Start program (i.e., Year 1 in the urban sites and Year 2 in the rural site), the scores were already very high. In Year 2, when the urban children were in preschool and the rural children were not, mean scores in the urban sites were significantly higher than scores in the rural site for both boys ($t = 3.95$, $df = 149$, $p < .01$) and girls ($t = 2.30$, $df = 132$, $p < .05$). However, by Year 3 when the children in the rural site were in Head Start, means in both sites were approaching ceiling levels and there were no significant site differences. There was an

Table 3

Means, Standard Deviations, and Predictive Correlations for Years 1, 2, and 3 Brown Scores for the Head Start Sample

		URBAN							RURAL						
					Correlations							Correlations			
		Minimum			Concurrent	Third-Grade			Minimum			Concurrent	Third-Grade		
Measure	Sex	n	M	SD	PSI	Read	Math	Raven	n	M	SD	PSI	Read	Math	Raven
Yr. 1 Brown	B	70	.85	.14	-.04	-.14	-.17	-.12	59	.79	.15	.13	.28*	.44**	.28*
Self-Referent	G	55	.82	.15	.38**	.19	.29*	.25*	52	.72	.17	.17	.36**	.48**	.26*
Yr. 2 Brown	B	67	.88	.12	.04	-.07	-.01	.08	76	.80	.13	.31**	.14	.27**	.02
Self-Referent	G	61	.86	.12	.38**	.29*	.23*	.33**	63	.81	.13	.40**	.21	.36**	.22*
Yr. 2 Brown Teacher-Referent	B	60	.86	.14	.08	-.01	.07	-.02							
	G	53	.84	.14	.32**	.19	.31*	.31*							
Yr. 3 Brown	B	74	.91	.08	--	.28**	.12	.16	81	.88	.11	.12	-.02	-.02	.09
Self-Referent	G	66	.89	.11	--	-.13	-.11	.03	66	.88	.12	.11	.03	-.05	-.10
Yr. 3 Brown Teacher-Referent	B	73	.90	.09	--	.12	.11	.23*	81	.87	.13	.31**	.16	.35**	.12
	G	66	.89	.11	--	-.14	-.15	-.02	66	.86	.14	.12	.11	.07	-.13

* $p < .05$, one-tailed
** $p < .01$, one-tailed

apparent tendency for the scores to increase with age which was independent of preschool experience. Note, for example, the increase for rural girls from Year 1 to Year 2 even though they did not enter Head Start until Year 3. Perhaps the most significant implication of these findings for early childhood education is that there is no general need to enhance the self-concept of economically disadvantaged children entering preschool programs, although, of course, certain individual children may need help in this area. However, since self-esteem scores were no longer uniformly high by third-grade (see Appendix Table B1), it is important for teachers to be aware of their behaviors which could cause reductions in the children's initially high levels of self-esteem.

Before using scores from these skewed distributions in correlational analyses they were normalized (i.e., forced into a normal distribution) with the mean set equal to 50 and a standard deviation of 10. Correlations of the Brown to the third-grade cognitive-perceptual scores are presented in Table 3; correlations with the Preschool Inventory (PSI) that was administered in the same year as the Brown are also included for comparison purposes. For a variety of reasons (e.g., child absence, tester error, etc.) a child occasionally would not receive a valid score on a particular instrument, causing the exact n on which each correlation was based to vary slightly. In order to simplify presentation of the tabular material, only the minimum value of n for a particular row of correlations is presented.

In the urban sites, Brown scores obtained in the Head Start year were predictive of third-grade performance only for girls. The within-year

correlations with achievement indicated a similar pattern, with a significant correlation with Year 2 PSI only for girls and a significant difference between the correlation for boys and for girls ($z = 2.06$, $p < .05$). This apparent sex difference in both within- and across-year correlations with achievement was apparently not caused by differential treatment in Head Start classes since the same pattern was evident in Year 1.

In the rural site, on the other hand, no significant sex differences were apparent in correlations with either Year 1 or Year 2 Brown scores. Year 1 Brown scores in the rural site were significantly correlated with all three third-grade cognitive-perceptual measures, but especially with math. These relatively high correlations are particularly interesting given the low correlations of the Brown with Year 1 PSI scores and the Brown's low correlation with third-grade measures of self-esteem (see Appendix Table B1). Thus, this early measure of self-esteem, though unrelated to later measures of self-esteem, was related to later achievement even though it was not strongly related to concurrent achievement. In Year 2 significant predictions to third-grade math were still evident, although within-year correlations to achievement were then equally high. By the Head Start year, there were no significant correlations with the Brown Self-Referent score, although the Teacher-Referent score continued to significantly predict math performance for boys. While Head Start experience may have contributed to the drop in predictive ability, other maturational factors may have been involved, since a similar drop from Year 2 to 3 was observed for the urban girls.

In order to assess the ability of the Brown to add to the prediction of performance on the third-grade cognitive-perceptual measures over what

could have been predicted solely from PSI scores in the Head Start year, part (or semi-partial) correlations were obtained (see Kerlinger & Pedhazur, 1973 for a concise discussion of this procedure). The test of the significance of the part correlation is equivalent to the test of the significance of adding the Brown to a regression equation predicting a cognitive-perceptual score from the PSI. These part correlations are presented in Table 4 (zero-order

Table 4

Part Correlations of Year 2 and 3 Brown Scores with Third-Grade Cognitive-Perceptual Measures for the Head Start Sample

		URBAN				RURAL			
		Minimum	Third-grade			Minimum	Third-grade		
Measure	Sex	n	Read	Math	Raven	n	Read	Math	Raven
Yr. 2 Brown	B	67	-.08	-.01	.07	79	.07	.19	-.02
Self-Referent	G	61	.09	.09	.12	63	.10	.25*	.14
Yr. 2 Brown	B	60	-.03	.06	-.03				
Teacher-Referent	G	53	.02	.20	.13				
Yr. 3 Brown	B	68	.20	.10	.13	87	-.06	-.07	.05
Self-Referent	G	63	-.11	-.10	.05	66	-.01	-.10	-.14
Yr. 3 Brown	B	68	.04	.09	.20	81	.05	.22*	.04
Teacher-Referent	G	63	-.16	-.17	-.04	66	.06	.02	-.17

Note. Year 2 PSI is partialed out of Brown scores in urban sample. (Zero-order correlations of Year 2 PSI to Year 6 Reading, Math, and Raven scores were as follows: for urban boys, .29, .08, and .14; and for urban girls, .53, .39, and .57). Year 3 PSI is partialed out of Brown scores in the rural sample. (Zero-order correlations of Year 3 PSI to Year 6 Reading, Math, and Raven scores were as follows: for rural boys, .37, .45, and .27; and for rural girls, .42, .45, and .32).

* $p < .05$, one-tailed

correlations of the PSI with the cognitive-perceptual scores also are presented). Except for two predictions to Math scores in the rural site (where the highest part correlation was only .25), Brown scores made no significant contributions to predictions from the PSI administered in Years 2 or 3. Thus, essentially all the predictive variation in early self-esteem scores was already reflected in the early achievement scores, and separate scores on the self-esteem measure are therefore unnecessary for making group predictions of cognitive-perceptual performance.

Although not part of the original analysis plan, the relatively high predictions of third-grade math from the Year 1 Brown scores in the rural site, combined with the low within-year correlation with PSI, suggested an additional analysis should be run to determine this part correlation. For boys, this part correlation (Year 1 Brown to Year 6 Math, controlling Year 1 PSI) was .39 and for girls .44, both of which were significant at the .01 level. Thus, at least in certain environmental contexts, measures of self-esteem obtained prior to Head Start entry add significantly to predictions of third-grade performance. Perhaps the Year 1 Brown score in part measures some personal quality (e.g., a motivational component) that is more necessary for performance on group achievement tests than on the individually administered PSI where the examiner can offer consistent encouragement to the child. This could be checked by comparing performance on similar group- and individually-administered tests within the same year. Another possible explanation is that self-esteem for these children is a more important predictor for skills learned outside of the immediate home environment, especially when the home environment offers a more limited

range of school-related learning opportunities and other significant teaching adults are more likely to come from a very different socio-cultural background. Thus, correlations should be higher to later achievements that depend more on learning in a school setting than to early PSI scores which depend more on learning within the home. The higher correlation of the Year 1 Brown with Year 3 PSI scores (.47 for boys and .44 for girls) than with Year 1 PSI scores is consistent with this interpretation. Thus, these data suggest potential links among self-esteem, intrinsic motivation, and readiness to learn/perform in a markedly different social situation. Further research is needed to determine what this Year 1 score is actually assessing, and to determine the causes of the decreases in predictive efficiency with increasing age.

Relationship of Preschool Measures of Achievement Motivation to Third-Grade Cognitive-Perceptual Performance for the Head Start Sample

Means and standard deviations for Gumpgookies are presented in Table 5. (Since Gumpgookies was first administered during the Head Start year, there are no Year 2 Gumpgookies scores in the rural site. Note also that the n was reduced in the urban sites in Year 3 because Gumpgookies in that year was group administered only in target classrooms.) While Adkins, Payne, and Ballif (1972) report results based on a total score plus four scores derived from a factor analysis of the items, attempts to replicate their factors, even after partialing for response bias, were unsuccessful. Further, alpha coefficients in the high .80's and low .90's for the total score suggested that subscores were unnecessary. Although Adkins, Payne and Ballif (1972) found a correlation of .34 between age (which ranged from 39 to 76 months in their sample) and total score, in the current sample with its more

Table 5

Means, Standard Deviations, and Predictive Correlations for Year 2 and 3 Gumpgookies Scores for the Head Start Sample

		URBAN							RURAL						
					Correlations							Correlations			
		Minimum			Concurrent	Third-Grade			Minimum			Concurrent	Third-Grade		
Measure	Sex	n	M	SD	PSI	Read	Math	Raven	n	M	SD	PSI	Read	Math	Raven
Year 2 Gumpgookies	B	64	52.70	10.87	.13	.36*	.04	.17							
	G	60	52.29	9.89	.32**	.22*	.13	.29*							
Year 3 Gumpgookies	B	44	56.85	10.56		-.18	-.06	-.09	74	53.73	11.14	.42**	.24*	.59**	.42**
	G	40	54.42	11.35		.35*	.31*	.34*	57	56.28	10.48	.33**	.39**	.55**	.16

* $p < .05$, one-tailed
** $p < .01$, one-tailed

restricted age range, the correlation of age with total score was only .17 in Year 2, .07 in Year 3, and .08 in Year 4. Hence, the conversion to age-normed Z-scores described by Adkins and Payne (1971) was not necessary in this sample. Consistent with previous findings (Adkins & Ballif, 1970), all of the means were relatively high and increased with age, although they did not approach the maximum possible score of 75. There were no significant sex differences.

To correct for the moderate skew of the Gumpgookies scores they were normalized prior to the correlational analyses reported in Table 5. In the urban sites, Gumpgookies scores in the Head Start year were predictive of third-grade reading for boys and girls and Raven scores for girls only. They were significantly correlated with the PSI only for girls. By the kindergarten year, Gumpgookies was no longer predictive of any of the third-grade scores for boys, although for girls it continued to predict reading and Raven scores, and in addition was predictive of math performance. In the rural site, Head Start year Gumpgookies scores were significantly related to third-grade performance in both reading and math and, for boys only, to Raven scores. Furthermore, the correlations with math scores were fairly substantial, accounting for 30 to 35 percent of the variance.

As indicated by the part correlations presented in Table 6, in the urban Head Start year Gumpgookies added to predictions of reading scores only for urban boys, and added nothing to predictions of math and Raven scores for either urban boys or girls; Year 3 Gumpgookies scores did not contribute to the predictions for urban children, with the predictive variation previously noted for girls reflected in the early achievement measure. In the

Table 6

Part Correlations of Year 2 and 3 Gumpgookies with Third-Grade Cognitive-Perceptual Measures for the Head Start Sample

		URBAN				RURAL			
		Minimum	Third-Grade			Minimum	Third-Grade		
Measure	Sex	n	Read	Math	Raven	n	Read	Math	Raven
Year 2	B	64	.32**	.03	.16				
Gumpgookies	G	60	.05	.01	.11				
Year 3	B	44	-.21	-.07	-.11	73	.09	.44**	.34*
Gumpgookies	G	40	.09	.13	.06	57	.27*	.42**	.06

Note. Year 2 PSI is partialed out of Gumpgookies scores in urban sample. (Zero-order correlations of Year 2 PSI to Year 6 Reading, Math, and Raven scores were as follows: for urban boys, .29, .08, and .14; and for urban girls, .53, .39, and .57). Year 3 PSI is partialed out of Gumpgookies scores in the rural sample. (Zero-order correlations of Year 3 PSI to Year 6 Reading, Math, and Raven scores were as follows: for rural boys, .37, .45, and .27; and for rural girls, .42, .45, and .32).

* $p < .05$, one-tailed
** $p < .01$, one tailed

rural site Gumpgookies scores in the Head Start year added significantly to predictions of third-grade reading only for girls and Raven scores only for boys. However, Gumpgookies added significantly to predictions of math scores for both boys and girls, accounting for an additional 18 to 19 percent of the math variance. Thus, for girls R^2 increased from .20 to .38 and for boys from .20 to .39. While these values are still too small to be of much use in making predictions for individuals, they do have programmatic implications in that they suggest that early attempts to enhance achievement motivation may make a significant independent contribution to the child's

later success in school. Also, a comparison in the rural site of the correlations of Year 3 Gumpgookies with concurrent or one year prior PSI scores (.42 and .35 for boys, and .33 and .32 for girls) to the correlation of Year 3 Gumpgookies with achievement estimates made three years later suggests that achievement motivation acts as a cause of achievement rather than being itself just a product of prior achievement.

Relationship of First-Grade Measures of Self-Esteem to Third-Grade Cognitive-Perceptual Performance

Means and standard deviations for first-grade scores on the Brown and School Perception Interview, Item 21 are presented in Table 7. Since by

Table 7

Means and Standard Deviations of First-Grade Measures of Self-Esteem and Correlations with Third-Grade Cognitive-Perceptual Measures for the Head Start Sample

		URBAN						RURAL					
		Minimum			Correlations			Minimum			Correlations		
Measure	Sex	n	M	SD	Read	Math	Raven	n	M	SD	Read	Math	Raven
Year 4 Brown Self-Referent	B	78	12.67	1.42	-.08	-.21	-.09	88	12.53	1.52	.08	.02	.06
	G	70	12.61	1.17	.03	.14	.00	68	12.42	1.73	-.13	-.12	-.14
Year 4 Brown Teacher-Referent	B	78	12.91	1.26	-.12	-.13	-.05	88	12.64	1.46	.12	.11	.15
	G	70	12.61	1.66	.01	.34**	.03	68	12.46	1.55	.01	-.01	-.06
Year 4 School Perception Interview Item 21	B	79	3.70	.69	.09	.29**	-.11	88	3.84	.45	.18	.05	-.10
	G	70	3.76	.59	.03	.13	.10	67	3.74	.61	-.16	-.29	-.11

* $p < .05$, one-tailed
** $p < .01$, one-tailed

first grade nearly all children were responding to all of the Brown items it was not necessary to obtain adjusted scores. As in previous years, mean scores were uniformly very high and there were no significant sex differences. The lack of urban-rural differences which emerged in Year 3 was maintained in Year 4. Similarly, the self ratings of school performance were generally very high, with the lowest subgroup mean 3.7 out of a possible 4.0. Thus, exposure to regular first-grade classes for at least six months had no negative effects on mean levels of self-esteem as assessed by these measures.

Brown scores were again normalized prior to correlational analyses. Although highly skewed, no transformation of the School Perception scores was attempted since the entire range was limited to four scores. As can be seen in Table 7, out of 36 correlations only two (both predicting third-grade math performance in the urban sites) were significant, and the larger of these accounted for less than 12% of the variance. As would be expected, partialing PSI scores from the Head Start year out of these self-esteem scores had little effect on the correlations (see Table 8).

Relationship of First-Grade Measures of Achievement Motivation to Third-Grade Cognitive-Perceptual Performance

Means and standard deviations for the three first-grade indicators of achievement motivation are presented in Table 9. Since the first-grade version of Gumpgookies contained 60 items, scores were approaching ceiling levels. Urban boys, however, continued to show considerable variability in performance. Similarly, the School Perception item on self-reported school enjoyment was close to its maximum of 3.0. Average teacher ratings of Task Orientation, while generally positive, were closer to the midpoint

Table 8

Part Correlations of First-Grade Measures of Self-Esteem with Third-Grade Cognitive-Perceptual Measures for the Head Start Sample

Measure	Sex	URBAN Minimum n	URBAN Third-Grade Read	URBAN Third-Grade Math	URBAN Third-Grade Raven	RURAL Minimum n	RURAL Third-Grade Read	RURAL Third-Grade Math	RURAL Third-Grade Raven
Brown Self-Referent	B	71	-.06	-.20	-.08	87	.08	.02	.06
	G	65	.06	.16	.03	68	-.09	-.17	-.11
Brown Teacher-Referent	B	71	-.13	-.13	-.05	87	.08	.06	.12
	G	65	-.06	.29*	-.05	68	.01	-.01	-.06
School Perception Item 21	B	79	.14	.31**	-.09	87	.12	-.02	-.15
	G	70	.01	.12	.08	67	-.14	-.27	-.09

Note. Year 2 PSI is partialed out of Self-Esteem scores in urban sample. (Zero-order correlations of Year 2 PSI to Year 6 Reading, Math, and Raven scores were as follows: for urban boys, .29, .08, and .14; and for urban girls, .53, .39, and .57). Year 3 PSI is partialed out of Self-Esteem scores in the rural sample. (Zero-order correlations of Year 3 PSI to Year 6 Reading, Math, and Raven scores were as follows: for rural boys, .37, .45, and .27; and for rural girls, .42, .45, and .32).

* $p < .05$, one-tailed
** $p < .01$, one-tailed

value of 15 than to the maximum possible score of 25. In both the urban and rural sites girls were rated significantly higher in Task Orientation (in the urban sites $t = 2.69$, $df = 151$, $p < .01$; in the rural site $t = 3.69$, $df = 156$, $p < .01$). Earlier Longitudinal Study findings (Emmerich, 1971)

Table 9

Means and Standard Deviations for First-Grade Measures of Achievement Motivations and Correlations with Third-Grade Cognitive-Perceptual Measures for the Head Start Sample

		URBAN						RURAL					
		Minimum			Correlations			Minimum			Correlations		
Measure	Sex	n	M	SD	Read	Math	Raven	n	M	SD	Read	Math	Raven
Gumpgookies	B	72	49.87	9.12	.14	.12	.14	88	53.31	5.29	.22*	.31**	.11
	G	64	52.93	6.65	.01	.16	.14	68	54.34	5.13	.06	.24*	-.02
Schaefer Task Orientation	B	77	16.23	5.67	.11	.18	.20*	88	14.88	6.58	.33**	.29**	.20*
	G	64	18.67	5.52	.58**	.53**	.40**	66	18.47	5.63	.26*	.34**	.16
School Perception Interview Item 1	B	76	2.61	.71	-.17	.04	-.10	86	2.36	.84	.25**	.26**	.21*
	G	69	2.59	.76	-.16	.08	-.10	67	2.49	.83	.00	.08	-.10

* $p < .05$, one-tailed
** $p < .01$, one-tailed

indicated similar sex differences in observer ratings of task orientation during free play in urban Head Start classes.

Prior to entry into the correlational analyses, Gumpgookies scores were normalized while the other scores were left in their raw score form. As can be seen in Table 9, in the urban sites neither self-report measure (Gumpgookies and School Perception Item 1) was significantly related to the third-grade cognitive-perceptual scores. In the rural site reported school enjoyment by boys was significantly related to the cognitive-perceptual scores, although the largest correlation accounted for less than 7% of

the variance. First-grade Gumpgookies scores in the rural site were still significantly related to third-grade math performance for both boys and girls, although to a significantly lesser extent than were the scores from Gumpgookies administered during the Head Start year. Gumpgookies scores were significantly related to reading scores only for boys and were not related to Raven scores for either boys or girls. Thus, the age period four to five and a half (i.e., prior to entry into first grade) appears to be a critical time for the administration of Gumpgookies since there is a notable drop in its predictive validity the following year.

In the urban sites Task Orientation ratings were predictive of reading and math performance only for girls, while in the rural site these teacher ratings were predictive for both boys and girls. Low but statistically significant correlations with Raven scores were obtained for all groups except rural girls. In the urban sites, the statistically significant difference between boys and girls in the predictions of both reading ($z = 3.18$, $p < .01$) and math ($z = 2.43$, $p < .05$) may reflect greater variability over time of achievement-related behaviors for boys or it may reflect a greater difficulty on the part of first-grade teachers in identifying predictive achievement-related behaviors in urban boys. The lack of prediction for boys was apparently not caused by a lack of variability in the teacher ratings or by ceiling problems on the rating scale, since the standard deviations of the ratings were almost identical in the two sex groups and the mean was higher for the girls. As was the case for Year 3 Gumpgookies, Task Orientation ratings in the rural site appeared to be more highly related to subsequent achievement than to achievement in the

previous year (for boys the correlation of Year 4 Task Orientation ratings with Year 3 PSI scores was .07, and for girls this correlation was .27). Similarly, for girls in the urban site the correlation of Year 2 PSI scores with Year 4 Task Orientation ratings was .31. These results suggest that such task-oriented behaviors are more the cause of than caused by actual achievement. Thus, preschool programs fostering such behaviors may be seen as having potential long-term positive effects on school performance.

In general, correlations were higher with the achievement tests than with the more general problem-solving skills represented by the Raven. This result implies that if programs designed to improve the achievement motivation of children were evaluated by assessing their impact on Raven scores (or scores from a similar problem-solving test), no program effects may be found even though the program may have a real effect on actual tested achievement.

Part correlations, partialing the Head Start year PSI scores from the Year 4 achievement motivation scores, are presented in Table 10. Gumpgookies "significantly" improved on the prior PSI scores only for predictions to math for boys in the rural site, and then it only accounted for an additional 4% of the variance which is not significant for any practical purposes. Schaefer Task Orientation ratings also contributed somewhat to predictions of math performance for rural children (and to boys' reading and Raven scores). However, Task Orientation ratings contributed relatively substantially to predictions of both reading and math for urban girls. Thus, even statistically holding differences in prior achievement constant, teachers' ratings for these children reflected behaviors that differentiated children's later levels of academic skills. The lack of incremental validity for ratings of urban/

Table 10

Part Correlations of First-Grade Measures of Achievement Motivation with Third-Grade Cognitive-Perceptual Measures for the Head Start Sample

		URBAN				RURAL			
		Minimum	Third-Grade			Minimum	Third-Grade		
Measure	Sex	n	Read	Math	Raven	n	Read	Math	Raven
Gumpgookies	B	66	.12	.11	.12	88	.12	.20*	.04
	G	58	-.02	.14	.11	68	-.04	.14	-.09
Schaefer Task Orientation	B	70	.01	.17	.17	87	.30**	.26**	.18**
	G	65	.44**	.43**	.23*	66	.15	.23*	.08
School Perception Interview Item 1	B	70	-.21	.03	-.12	86	.16	.15	.14
	G	69	-.11	.12	-.05	67	-.05	.03	-.14

Note. Year 2 PSI is partialed out of Achievement Motivation scores in urban sample. (Zero-order correlations of Year 2 PSI to Year 6 Reading, Math, and Raven scores were as follows: for urban boys, .29, .08, and .14; and for urban girls, .53, .39, and .57). Year 3 PSI is partialed out of Achievement Motivation scores in the rural sample. (Zero-order correlations of Year 3 PSI to Year 6 Reading, Math, and Raven scores were as follows: for rural boys, .37, .45, and .27; and for rural girls, .42, .45, and .32).

* $p < .05$, one-tailed
** $p < .01$, one-tailed

northern boys is consistent with previous findings by Kohn and Rosman (1974), whose entire sample consisted of boys from New York City. However, the current results suggest that for different populations (e.g., urban girls) first-grade teachers apparently can identify academic achievement-related classroom behaviors that improve predictions based on earlier indications of actual performance. To what extent this finding reflects an expectancy cycle of effects is unknown.

Moderator Variable Analyses

The analyses presented in the following sections were designed to investigate the possibility that certain child characteristics (cognitive level, response tempo, and cooperativeness) interact with measures of self-esteem and achievement motivation in predicting third-grade achievement. In these analyses the urban and rural Head Start samples were divided into thirds on the basis of scores on the child characteristics assessed in the spring prior to entry into a Head Start program. For each of the three levels on these initial characteristics, correlations and part correlations controlling for concurrent PSI level were run relating Head Start year scores on the Brown and Gumpgookies to third-grade reading and math achievement scores. In the absence of significant sex by level interactions in the correlational patterns, only the results for the combined sexes are presented. Since children with scores on the moderator variables were assigned to only one level (i.e., high, medium, or low), rather than being split between adjacent levels, the number of children in the various levels was sometimes slightly disproportional; therefore, exact ns for each mean and correlation are provided in parentheses following the statistic.

These analyses were primarily intended to generate hypotheses for future research rather than to confirm a priori theories. Therefore, apparent trends in the data are sometimes noted even when they fail to meet conventional levels of statistical significance and multiple comparisons involving the same mean or correlation were sometimes run without making any adjustment in the significance levels of the statistical tests. While these procedures maximize the chances for discovering relationships, they also

may lead to "results" that are unique to this sample and could not be replicated.

Relationship of Status on Year 1 PSI to Predictions from Year 2 Measures for the Urban Head Start Sample

This set of analyses was designed to determine the possible moderating effects of initial cognitive level, i.e., whether correlations from the Brown and Gumpgookies differed according to the child's initial PSI score. Since Year 2 PSI was the score partialed from the Brown and Gumpgookies in the part correlations, its relationships to third-grade achievement for differing initial cognitive levels are presented first. As can be seen in Table 11, the pattern of means reflects the correlation of .55 between Year 1 and Year 2 PSI scores. Correlations to both reading and math were significant only for children who scored in the top third on Year 1 PSI, and were significantly different ($p < .05$) from correlations in both the middle and low groups. Note that the standard deviation of the PSI scores

Table 11

Year 2 PSI Means, Standard Deviations, and Correlations for Three Levels of Year 1 PSI in the Urban Head Start Sample

	Status on Year 1 PSI		
Statistic	High[M=34.42]	Middle[M=23.33]	Low[M=13.51]
M	45.78 (46)	38.70 (43)	34.76 (38)
SD	7.79	7.73	7.79
r (Reading)	.58** (42)	.20 (40)	.11 (35)
r (Math)	.41** (44)	-.01 (42)	.02 (37)

Note. Number in parenthesis is n for statistic. Mean score on moderator variable is in brackets following label for each level.

*$p < .05$, one-tailed
**$p < .01$, one-tailed

was identical in both the high and the low groups, and thus the difference in predictions cannot be attributed to a lack of variation among children who performed poorly on this test. Thus, children in the middle and lower thirds on the Year 1 PSI varied more between years in their levels of achievement in school-related skills. It may be that these children were exposed to greater variation in their subsequent learning environments. For example, some children in these lower groups may be exemplifying short-term Head Start cognitive gains which were not sustained by their later experiences. It should be noted, however, that mean third-grade reading and math achievement scores were consistent with initial classifications although individual variations were not stable.

Means and standard deviations for the normalized Brown and Gumpgookies scores for each level of the Year 1 PSI are presented in Table 12. There appeared to be a slight trend in both measures in the direction of increasing means with increasing PSI levels. This slight linear trend was confirmed by the correlation between Year 1 PSI and Year 2 Brown of .16; although the correlation of .12 between Year 1 PSI and Year 2 Gumpgookies was not significant. Table 12 also indicates the absence of any significant differences in levels of prediction from either Brown or Gumpgookies for children in differing PSI levels.

Relationship of Status on Year 2 PSI to Predictions from Year 3 Measures for the Rural Head Start Sample

Given the correlation between Year 2 and Year 3 PSI scores of .75, the strong relationship of Year 3 PSI means to status on Year 2 PSI and the small within-category standard deviations indicated in Table 13 were not surprising.

Table 12

Year 2 Brown and Gumpgookies Means, Standard Deviations, and Correlations for Three Levels of Year 1 PSI in the Urban Head Start Sample

		Status on Year 1 PSI		
Measure	Statistic	High[M=34.42]	Middle[M=23.33]	Low[M=13.51]
Brown Self-Referent	M	51.99 (45)	51.01 (42)	48.89 (38)
	SD	9.61	7.45	10.39
	r (Reading)	.10 (41)	-.19 (39)	.16 (35)
	Part r (Reading)	.05	-.18	.13
	r (Math)	.02 (43)	-.09 (41)	.26 (37)
	Part r (Math)	-.01	-.09	.26
Gumpgookies	M	50.71 (44)	50.00 (34)	47.03 (38)
	SD	11.56	8.11	8.47
	r (Reading)	.21 (40)	.10 (36)	.13 (35)
	Part r (Reading)	.09	.10	.10
	r (Math)	.11 (42)	.15 (38)	-.03 (37)
	Part r (Math)	.03	.15	-.03

Note. Means and standard deviations are for normalized scores (M = 50, SD = 10). Number in parenthesis is n for statistic.

Table 13

Year 3 PSI Means, Standard Deviations, and Correlations for Three Levels of Year 2 PSI in the Rural Head Start Sample

	Status on Year 2 PSI		
Statistic	High[M=39.00]	Middle[M=27.76]	Low[M=18.25]
M	52.33 (49)	46.65 (49)	41.66 (47)
SD	4.52	4.91	4.87
r (Reading)	.21 (48)	.12 (49)	.33*(45)
r (Math	.36**(49)	.39**(48)	.12 (47)

Note. Number in parenthesis is n for statistic.

* $p < .05$, one-tailed
** $p < .01$, one-tailed

Although for the total rural Head Start sample Year 3 PSI scores were found to be significantly related to third-grade reading and math achievement scores, in the present analyses the correlation with reading performance was significant only for those children who entered Head Start with relatively low scores, while the correlation with math performance was significant only for those children in the high and middle Year 2 PSI score groups. There were no significant differences, however, among the correlations from Year 3 PSI scores; thus, a pattern of higher correlations for higher PSI scores found in the urban sample in Year 2 was not confirmed for the Year 3 scores in the rural Head Start sample. Since the mean Year 3 PSI score for the rural low group is above the Year 2 PSI means for the low and middle urban groups, there may be a critical absolute PSI level for obtaining differential predictions.

As indicated in Table 14, as was found with the urban Head Start sample, means of both Brown Self-Referent and Gumpgookies scores tended to increase with higher levels of PSI, although the linear correlation was significant only for Gumpgookies (r = .35) and not for the Brown (r = .14). There were no significant differences among the correlations. Predictions from Year 3 Gumpgookies scores in the rural site, then, were equally good for children who entered Head Start with relatively high, average, or low cognitive abilities; Year 3 Brown scores were not predictive of academic achievement scores in any of the groups.

Relationship of Status on Year 1 Matching Familiar Figures Test Latency to Predictions from Year 2 Measures for the Urban Head Start Sample

The Year 2 PSI means presented in Table 15 indicate the previously noted (Ward, 1973) lack of relationship for study children at this age level between

Table 14

Year 3 Brown and Gumpgookies Means, Standard Deviations, and Correlations for Three Levels of Year 2 PSI in the Rural Head Start Sample

Measure	Statistic	Status on Year 2 PSI High[M=39.00]	Middle[M=27.76]	Low[M=18.25]
Brown Self-Referent	M	49.59 (49)	47.58 (48)	46.83 (47)
	SD	9.05	11.05	8.93
	r (Reading)	-.10	-.05 (48)	-.02 (45)
	Part r (Reading)	-.10	-.05	-.11
	r (Math)	-.15 (49)	-.21 (47)	.12 (47)
	Part r (Math)	-.16	-.18	.09
Gumpgookies	M	52.39 (43)	48.30 (43)	44.64 (39)
	SD	8.91	11.09	7.92
	r (Reading)	.21 (42)	.20 (43)	.27 (37)
	Part r (Reading)	.15	.18	.20
	r (Math)	.45**(43)	.54*(42)	.49**(39)
	Part r (Math)	.35*	.48**	.47**

Note. Means and standard deviations are for normalized scores (M = 50, SD = 10). Number in parenthisis is n for each statistic.

* $p < .05$, one-tailed
** $p < .01$, one-tailed

Table 15

Year 2 PSI Means, Standard Deviations, and Correlations for Three Levels of Year 1 MFF Latencies in the Urban Head Start Sample

Statistic	Status on Year 1 MFF Latency High [M=.71][a]	Middle [M=.58]	Low [M=.48]
M	41.85 (40)	39.55 (38)	40.30 (43)
SD	9.21	8.26	8.68
r (Reading)	.66**(37)	.41**(33)	.30*(41)
r (Math)	.49**(39)	-.02 (36)	.17 (42)

Note. Number in parenthesis is n for statistic.

[a]Latency mean based on log(X+1) transformation.
*$p < .05$. one-tailed
**$p < .01$, one-tailed

latencies on the Matching Familiar Figures Test (MFF) and cognitive performance. There appeared to be a tendency, however, for predictive correlations to be higher for children with the longest latencies and, for all groups, to be higher with reading than with math achievement scores.

As indicated in Table 16, mean scores on both the Brown and Gumpgookies were essentially identical across the three levels of MFF latency scores. There were no significant differences in the correlations from the Brown, although the part correlations suggested that reported self-esteem contributes significantly to third-grade math performance for children with initial low (i.e., fast) latencies. Gumpgookies, however, was a significantly

Table 16

Year 2 Brown and Gumpgookies Means, Standard Deviations, and Correlations for Three Levels of Year 1 MFF Latency Scores in the Urban Head Start Sample

		Status on Year 1 MFF Latency		
Measure	Statistic	High[M=.71][a]	Middle[M=.58]	Low[M=.48]
Brown	M	49.56 (39)	52.83 (38)	50.81
Self-Referent	SD	10.87	9.20	6.78
	r (Reading)	.14 (36)	.10 (33)	.09 (40)
	Part r (Reading)	.05	.04	.09
	r (Math)	.10 (36)	-.03 (36)	.27*(41)
	Part r (Math)	.03	-.03	.27*
Gumpgookies	M	49.90 (39)	50.77 (34)	48.32 (42)
	SD	9.12	10.94	9.09
	r (Reading)	.08 (36)	.05 (29)	.50**(40)
	Part r (Reading)	.00	-.06	.46**
	r (Math)	-.16 (38)	.33 (32)	.29* (41)
	Part r (Math)	-.22	.34	.27*

Note. Means and standard deviations are for normalized scores (M = 50, SD = 10). Number in parenthesis is n for statistic.

[a]Latency mean based on log(X+1) transformation.

*$p < .05$, one-tailed

**$p < .01$, one-tailed

better predictor for children with a fast response style than for children with a relatively slow response style (for reading $z = 1.96$, $p < .05$; and for math $z = 1.96$, $p < .05$). Perhaps on a measure like Gumpgookies initial responses are the most valid. Scores for children who respond quickly therefore would be more predictive. Another possibility is that the short latency category comprises two kinds of children. Thus, some fast responders may be highly motivated children who perceive that they are being timed and therefore answer quickly, while other fast responders may be very unmotivated for the task and simply respond without thinking in order to finish the task quickly; if children in the former category got high Gumpgookies scores while children in the latter group got low scores, a relatively high correlation between Gumpgookies and later achievement in the fast responding group as a whole might be expected.

Relationship of Status on Year 2 MFF Latency to Predictions from Year 3 Measures for the Rural Head Start Sample

Table 17 indicates that mean levels on Year 3 PSI were essentially unrelated to status on MFF latency. Similarly, there were no significant differences among the correlations to third-grade achievement. Table 18 indicates a similar lack of mean or correlational differences for Year 3 Brown and Gumpgookies scores. While the correlation of Gumpgookies to reading appears to be lower for children in the middle MFF latency group, it is not significantly different from the correlations in the high and low groups. The higher correlations from Gumpgookies to math for children with short latencies (i.e., the low group) that were noted in the urban Head Start sample in Year 2 were not replicated. Instead, Gumpgookies performance contributed significantly to the prediction of third-grade math

Table 17.

Year 3 PSI Means, Standard Deviations, and Correlations for Three Levels of Year 2 MFF Latency Scores in the Rural Head Start Sample

	Status on MFF Latency		
Statistic	High [M=.71][a]	Middle [M=.59]	Low [M=.46]
M	46.40 (48)	46.51 (49)	47.92 (48)
SD	6.97	6.14	6.24
r (Reading)	.56**(48)	.27*(49)	.38**(45)
r (Math)	.60**(47)	.33*(49)	.53**(48)

Note. Number in parenthesis is n for statistic.

*p < .05, one-tailed
**p < .01, one-tailed

Table 18

Year 3 Brown and Gumpgookies Means, Standard Deviations, and Correlations for Three Levels of MFF Latency Scores in the Rural Head Start Sample

		Status on MFF Latency		
Measure	Statistic	High[M=.77][a]	Middle[M=.59]	Low[M=.46]
Brown Self-Referent	M	47.66 (48)	48.77 (49)	47.05 (47)
	SD	9.10	10.86	9.26
	r (Reading)	-.19 (48)	.07 (49)	.09 (44)
	Part r (Reading)	-.24	.04	.00
	r (Math)	-.16 (47)	-.05 (49)	.12 (47)
	Part r (Math)	-.21	-.09	.00
Gumpgookies	M	48.22 (42)	47.27 (39)	50.30 (44)
	SD	11.60	8.29	9.39
	r (Reading)	.35*(42)	.09 (39)	.40**(41)
	Part r (Reading)	.14	.02	.26
	r (Math)	.68**(41)	.49**(39)	.52**(47)
	Part r (Math)	.48**	.42**	.32*

Note. Means and standard deviations are for normalized scores (M = 50, SD = 10). Number in parenthesis is n for statistic.

[a]Latency mean based on log(X+1) transformation
*p < .05, one-tailed
**p < .01, one-tailed

achievement scores regardless of the child's prior latency response to the MFF.

Relationship of Status on Year 1 Cooperation Ratings to Predictions from Year 2 Measures for the Urban Head Start Sample

These analyses are limited to the urban Head Start sample since the Eight-Block Interaction Task was not administered in Lee County in Year 2, the spring prior to entry into Head Start in that site. As can be seen in Table 19, there was a tendency for Year 2 PSI to increase as Cooperation ratings increased. Indeed, the significant correlation between these two scores of -.27 indicated the existence of such a linear trend. While one might expect achievement scores to be less valid among children rated as relatively uncooperative, the correlations to reading were actually highest in the group with the lowest cooperation ratings. These findings suggest the generalization of personal and social behaviors which facilitate or interfere with learning (e.g., attentiveness, involvement, attitudes toward teaching adult) and the cumulative effects of early learning difficulties. However, given the

Table 19

Year 2 PSI Means, Standard Deviations, and Correlations for Three Levels of Year 1 Cooperation Ratings in the Urban Head Start Sample

	Status on Year 1 Cooperation Ratings		
Statistic	High [M=1.35][a]	Middle [M=3.15]	Low [M=6.24]
M	41.62 (37)	39.89 (37)	37.78 (36)
SD	9.50	8.48	8.41
r (Reading)	.32*(33)	.35*(35)	.61**(33)
r (Math)	.13 (36)	.34*(37)	.28* (35)

Note. Number in parenthesis is n for statistic.

[a]Low scores indicate a high level of cooperation.

*p < .05, one-tailed

**p < .01, one-tailed

small sample sizes, the correlations for the three groups did not differ significantly.

Table 20 indicates that Brown mean scores also were related to status on the Cooperation ratings; the correlation of -.24 between these two scores indicated a small but statistically significant linear relationship. This could be caused by the tendency of teachers to give more positive feedback to cooperative children, which in turn would enhance the self-esteem of these children. Also, since an attentive, task-oriented child is more likely to benefit in a learning situation, the increase in competencies is likely to result in more positive self-regard. While correlations with

Table 20

Year 2 Brown and Gumpgookies Means, Standard Deviations, and Correlations for Three Levels of Year 1 Cooperation Ratings in the Urban Head Start Sample

		Status on Year 1 Cooperation Ratings		
Measure	Statistic	High[M=1.35][a]	Middle[M=3.15]	Low[M=6.24]
Brown	M	53.27 (37)	50.60 (37)	48.92 (35)
Self-	SD	8.45	8.61	10.41
Referent	r (Reading)	-.18 (33)	.26 (35)	-.05 (32)
	Part r (Reading)	-.27	.25	-.10
	r (Math)	.06 (36)	.30*(37)	-.14 (34)
	Part r (Math)	.03	.28*	-.16
Gumpgookies	M	50.78 (34)	52.07 (35)	46.06 (34)
	SD	9.78	9.54	8.70
	r (Reading)	.11 (31)	.28 (33)	.24 (31)
	Part r (Reading)	.06	.22	.08
	r (Math)	.13 (34)	-.01 (35)	.27 (33)
	Part r (Math)	.11	-.07	.21

Note. Means and standard deviations are for normalized scores (M = 50, SD = 10). Number in parenthesis is n for statistic.

[a] Low scores indicate a high level of cooperation.

* $p < .05$, one-tailed

third-grade reading and math achievement scores appeared to be slightly higher for children with moderate Cooperation ratings, there were no significant differences among the correlations.

Gumpgookies scores also were related to Cooperation ratings (r = -.28), indicating some generalization of attentiveness to cognitive task demands across years for both self-report and situational measures. Status on the Cooperation ratings, however, did not significantly influence the level of correlations between Gumpgookies and the third-grade achievement scores.

Summary of Moderator Variable Analyses

In general, initial status on measures of cognitive level, response tempo, and cooperation did not significantly influence predictions from Head Start year scores on the Brown or Gumpgookies. However, a tendency in the urban site for Gumpgookies scores to be more predictive for fast than for slow responders was noted. In addition, Year 2 PSI scores in the urban sites appeared to be most valid for the high ability children; indeed, Year 2 PSI scores were not significantly related to third-grade reading and math for urban children classified in either the middle or bottom third on Year 1 PSI. The lack of replication of these findings in the rural Head Start sample may reflect chance findings given the small sample sizes involved, or differential findings according to absolute levels of scores and/or variation in meanings of scores at different developmental levels.

In both the urban and rural sites, during the preschool period greater self-esteem and achievement motivation were associated with higher pre-academic skills. Also, those urban children who were rated as more

cooperative during the Year 1 mother-child Eight-Block Interaction session tended to have higher self-esteem, achievement motivation, and preacademic skills in the spring of the Head Start year. The generalization of task orientation across years may be seen as facilitating the child's learning, thereby leading to greater positive reinforcement and increased self regard.

As noted earlier, these findings are at best suggestive of promising directions for future research. The main analyses for the present report described the influence of concurrent cognitive level upon predictions of third-grade academic achievement from preschool measures of self-esteem and achievement motivation. In future analyses the modifying effect of concurrent assessment of response latency and cooperation might be examined and the extent of agreement with present findings determined. Also, additional study findings may suggest other variables for meaningful differentiation both among children and their environments.

Comparative Findings for the Urban "No Preschool" Sample

In the following set of analyses results are presented for the sample of urban black children who, according to study records, had not attended a preschool of any kind. Although these children came from families of slightly higher socioeconomic status than those in the Head Start sample (see sample description in Chapter 2), they were initially similar in terms of their Year 1 PSI scores ($\underline{M}$ = 39.39 vs. 38.67, $\underline{SD}$ = 9.26 vs. 8.89, respectively). While the general rule in previous tables was to not report correlations based on fewer than 20 children, that rule was not used in tables in this section due to the small size of the "No Preschool" sample, although no correlation reported was based on fewer than 15 children. With such small samples, inferences based on the relative sizes of correlation

coefficients must be made very cautiously. For example, with samples of 20 children correlations must be at least .38 to be significantly different from zero at the .05 level, one-tailed.

Relationship of the Measures of Self-Esteem to Third-Grade Cognitive-Perceptual Performance for the Urban "No Preschool" Sample

The results of the analyses for the self-esteem measures presented in Table 21 can be compared to the results for the Head Start sample presented

Table 21

Means, Standard Deviations, and Predictive Correlations for Self-Esteem Measures in the Urban "No Preschool" Sample

Measure	Sex	Minimum n	M	SD	Correlations: Concurrent PSI	Third-Grade Read	Third-Grade Math	Third-Grade Raven
Year 1 Brown	B	22	.83	.17	.29	.17	.13	.07
Self-Referent	G	28	.83	.15	.15	.10	.13	-.25
Year 2 Brown	B	18	.87	.15	.64**	.50*	.45*	.18
Self-Referent	G	25	.90	.07	.21	.06	.02	-.18
Year 3 Brown	B	23	.92	.07		.04	.38*	.29
Self-Referent	G	31	.92	.08		.26	.38*	-.05
Year 3 Brown	B	23	.92	.11		.09	.49**	.20
Teacher-Ref.	G	30	.94	.09		.12	.21	.29
Year 4 Brown	B	20	12.70	1.29		.10	-.02	-.25
Self-Referent	G	31	12.82	1.18		.10	.26	-.08
Year 4 Brown	B	19	12.67	1.49		.10	.17	-.07
Teacher-Ref.	G	31	12.82	1.04		.23	.29	-.24
Year 4 School Perception Interview Item 21	B	20	3.48	.90		.22	.21	.05
	G	31	3.82	.39		.10	.07	.29

* $p < .05$, one-tailed
** $p < .01$, one-tailed

in Tables 3 and 7. Mean values in both samples were quite high and did not differ significantly, suggesting that the urban Head Start programs had no significant impact on self-esteem as measured by the Brown. As was found for the urban Head Start sample, mean Brown scores for the urban "No Preschool" group tended to be higher than for the rural Head Start group; in Year 3, with the rural sample attending Head Start, no significant differences were obtained. Although children's self reports of school performance in first-grade generally were high, the mean for urban "No Preschool" boys was lower than that for urban and rural Head Start boys and girls.

A comparison of predictions from the Year 2 Brown in the two samples indicated somewhat higher predictions for "No Preschool" boys than for Head Start boys; this trend was not evident for girls. For boys, the differences between the correlations in the two samples were significant for the correlations of Year 2 Brown to both concurrent PSI ($z = 2.70$, $p < .05$) and reading ($z = 2.17$, $p < .05$), although the difference in the predictions to math was not significant ($z = 1.84$, $p > .05$). However, since the same trend was evident in Year 1 (i.e., before the Head Start sample entered classes), the difference does not appear to have been caused by Head Start attendance.

A comparison of the part correlations presented in Table 22 with those for the Head Start sample reported in Tables 4 and 8 suggests the absence of any significant differences, with self-esteem measures not adding significantly to the prediction of third-grade performance from Year 2 PSI scores.

Relationship of the Measures of Achievement Motivation to Third-Grade Cognitive-Perceptual Performance for the Urban "No Preschool" Sample

The data presented in Table 23 reveal the same trend noted earlier for Gumpgookies scores to increase with age. As was generally found for the

Table 22

Part Correlations of Self-Esteem Measures with Third-Grade Cognitive-Perceptual Measures for the Urban "No Preschool" Sample

Measure	Sex	Minimum n	Third-Grade Read	Third-Grade Math	Third-Grade Raven
Year 2 Brown	B	18	.32	.29	.13
Self-Referent	G	25	-.01	-.05	-.20
Year 3 Brown	B	22	-.11	.27	.26
Self-Referent	G	26	.14	.27	-.08
Year 3 Brown	B	22	-.05	.34	.16
Teacher-Referent	G	26	-.14	-.01	.05
Year 4 Brown	B	18	.11	-.01	-.25
Self-Referent	G	25	.10	.26	-.08
Year 4 Brown	B	18	.07	.14	-.08
Teacher-Referent	G	25	.13	.18	-.28
Year 4 School Perception Interview Item 21	B	21	.15	.15	.03
	G	25	.17	.15	.31

Note. Year 2 PSI score is partialed out of Self-Esteem scores. (Zero-order correlations of Year 2 PSI to Year 6 Reading, Math, and Raven scores, respectively, were as follows: for boys, .39, .36, .13, and for girls, .32, .35, .07.)

urban and rural Head Start samples, differences between the sexes favored girls, but they were too small to be significant. A comparison of the results presented in Table 23 with the comparable results presented in Tables 5 and 9 indicates a slight, though consistent, trend for achievement motivation scores to be higher in the "No Preschool" sample. In Year 3,

Table 23

Means, Standard Deviations, and Predictive Correlations for Year 2, 3, and 4 Achievement Motivation Scores for the Urban "No Preschool" Sample

Measure	Sex	Minimum n	M	SD	Correlations: Concurrent PSI	Third-Grade Read	Third-Grade Math	Third-Grade Raven
Year 2 Gumpgookies	B	18	52.38	10.74	.49*	.01	.34	-.02
	G	22	55.21	9.08	.42*	.27	.20	.17
Year 3 Gumpgookies	B	18	59.74	7.89		-.42	-.03	.11
	G	18	62.11	6.14		.46*	.34	.61**
Year 4 Gumpgookies	B	21	50.42	10.68		.23	.31	.06
	G	25	54.50	4.10		-.21	-.30	.09
Year 4 Schaefer Task Orientation	B	20	18.65	5.26		.34	.05	-.08
	G	32	20.41	5.02		.25	.11	.08
Year 4 School Perception Interview Item 1	B	20	2.74	.62		-.01	.37	.34
	G	31	2.70	.64		.04	-.12	.21

* $p < .05$, one-tailed
** $p < .01$, one-tailed

when Gumpgookies scores for girls were most predictive of later achievement, Gumpgookies scores for girls in the "No Preschool" sample were significantly higher than girls' scores in the Head Start sample ($t = 3.34$, $df = 56$, $p < .05$). As was found in the urban and rural Head Start samples, teachers' ratings of the children's task orientation in first grade favored girls.

The correlation patterns were fairly similar in the two samples, with Year 3 Gumpgookies again predicting achievement only for girls. Although the correlation of Year 2 Gumpgookies with concurrent PSI appears to be higher for "No Preschool" boys than for Head Start boys, this difference was not significant ($z = 1.04$, $p > .05$). In contrast to the significant correlations with third-grade achievement obtained for urban Head Start girls, teacher ratings of those urban children who had not attended preschool were not significantly related to the children's later school skills. The part correlations are presented in Table 24, which may be compared to the part correlations for the Head Start sample presented in Tables 6 and 10. Patterns of part correlations for the Gumpgookies scores were essentially similar in the two samples. However, for the "No Preschool" group, Gumpgookies scores in Year 3, when these children attended kindergarten and were first enrolled in school, did contribute significantly to third-grade reading scores.

Summary of Results for Urban "No Preschool" Sample

Few differences were found in either mean levels or patterns of correlations between the urban "No Preschool" and Head Start samples. Although Head Start attendance in general had no significant differential impact on these scores, certain individual Head Start programs or teachers may have been differentially effective. In addition, generalizations should be made very cautiously from the "No Preschool" sample because of its small size. Since all children in the "No Preschool" sample were from areas where Head Start programs were available, these children were from families that chose not to send their children to Head Start or any other preschool program, and they thus are not representative of families that were unable to enroll their children because

Table 24

Part Correlations of Measures of Achievement Motivation with Third-Grade Cognitive-Perceptual Measures for the Urban "No Preschool" Sample

Measure	Sex	Minimum n	Third-Grade Read	Third-Grade Math	Third-Grade Raven
Year 2 Gumpgookies	B	18	-.21	.19	-.10
	G	22	.14	.06	.16
Year 3 Gumpgookies	B	15	-.52	-.12	.08
	G	15	.44*	.31	.61**
Year 4 Gumpgookies	B	18	.23	.31	.06
	G	20	-.09	-.18	.13
Year 4 Schaefer Task Orientation	B	17	.30	.01	-.09
	G	27	.18	.03	.06
Year 4 School Perception Interview Item 1	B	19	-.19	.25	.31
	G	24	.03	-.13	.21

Note. Year 2 PSI score is partialed out of Achievement-Motivation scores. (Zero-order correlations of Year 2 PSI to Year 6 Reading, Math, and Raven scores, respectively, were as follows: for boys, .39, .36, .13, and for girls, .32, .35, .07.)

* $p < .05$, one-tailed
** $p < .01$, one-tailed

no program existed. The higher Year 1 SES level in the "No Preschool" sample also suggests that the two samples were not initially totally comparable. Continuing group differences in the home environment may have occurred which interacted with the variables under investigation. The differential effects of SES level are explored more fully in the next section.

Comparative Findings for the Rural "Other Preschool" Sample

The following analyses for the rural "Other Preschool" sample provide a basis for comparison with a group of children who were different from the rural Head Start sample in terms of race and socioeconomic status, but who also had group preschool experiences. Thus, these analyses were not designed to show the impact of preschool experiences on self-esteem and achievement motivation or their correlates with achievement, rather they provide an additional method of determining the stability of relationships across children with very different background characteristics.

Relationship of Measures of Self-Esteem to Third-Grade Cognitive-Perceptual Measures for the Rural "Other Preschool" Sample

Comparing the means for the rural "Other Preschool" sample presented in Table 25 with those for the rural Head Start sample presented in Tables 3 and 7, it appears that in Years 1 and 2 self-esteem scores were slightly higher in the "Other Preschool" sample, although by Year 3, when both groups were attending preschool, there were essentially no differences, with both samples at ceiling levels. In Year 4 Brown scores remained at very high levels in both samples. Similarly, scores on the School Perception Interview item were high in both samples. Thus, in first grade, following Head Start attendance, there was no evidence for lower self-esteem in low-SES populations.

The patterns of correlations were fairly similar in the two samples, except for girls in Year 2 where the correlations of the Brown to both concurrent and later achievement were negative in the "Other Preschool" sample, but positive in the Head Start sample. The absence of such a trend in either Year 1 or Year 3 suggests that chance fluctuations in this highly

Table 25

Means, Standard Deviations, and Predictive Correlations for Self-Esteem Measures for the Rural "Other Preschool" Sample

Measure	Sex	Minimum n	M	SD	Correlations: Concurrent PSI	Third-Grade Read	Third-Grade Math	Third-Grade Raven
Year 1 Brown	B	32	.86	.14	.34*	.28	.38*	.34*
Self-Referent	G	28	.88	.15	.20	.11	.25	.04
Year 2 Brown	B	36	.88	.11	.27	.18	.29*	.23
Self-Referent	G	28	.91	.08	-.44	-.31	-.25	-.42
Year 3 Brown	B	36	.89	.10	.29*	.24	.30*	.54**
Self-Referent	G	29	.92	.08	.21	.33*	.29	.33*
Year 3 Brown	B	33	.92	.11	.25	.07	.13	.36
Teacher-Ref.	G	29	.92	.08	.07	.12	.22	.29
Year 4 Brown	B	40	12.52	1.54		.19	.20	.22
Self-Referent	G	33	12.71	1.31		-.02	.13	.06
Year 4 Brown	B	40	12.55	1.63		.33*	.35*	.27*
Teacher-Ref.	G	33	12.47	1.83		-.23	-.06	-.03
Year 4 School Perception Interview Item 21	B	40	3.35	.83		.23	.36*	.31*
	G	33	3.59	.56		-.12	-.21	-.19

* $p < .05$, one-tailed
** $p < .01$, one-tailed

skewed distribution may have contributed to this result. Also, for the "Other Preschool" group, in first-grade boys' Teacher-Referent Self-Esteem scores were significantly related to their third-grade cognitive performance. Similarly, these boys' perception of how well they were doing in school was significantly related to their third-grade math scores. Indeed, for

white middle-SES boys, their self-esteem scores in Years 1 through 4 were consistently related to their third-grade math scores.

The part correlations presented in Table 26 may be compared with the part correlations presented in Tables 4 and 8. There were no significant differences between the two samples in these part correlations. Note that

Table 26

Part Correlations of Self-Esteem Measures with Third-Grade Cognitive-Perceptual Measures for the Rural "Other Preschool" Sample

Measure	Sex	Minimum n	Third-Grade Read	Third-Grade Math	Third-Grade Raven
Year 2 Brown Self-Referent	B	35	.14	.25	.17
	G	28	-.09	-.01	-.18
Year 3 Brown Self-Referent	B	35	.15	.20	.39**
	G	27	.20	.16	.19
Year 3 Brown Teacher-Referent	B	33	-.02	.03	.22
	G	32	.08	.18	.25
Year 4 Brown Self-Referent	B	35	.14	.15	.15
	G	28	.03	.18	.11
Year 4 Brown Teacher-Referent	B	35	.27	.28*	.17
	G	28	-.06	.13	.17
Year 4 School Perception Interview Item 21	B	35	.15	.27	.17
	G	28	-.02	-.11	-.09

Note. Year 3 PSI score is partialed out of Self-Esteem scores. (Zero-order correlations of Year 3 PSI to Year 6 Reading, Math, and Raven scores, respectively, were as follows: for boys, .34, .40, and .57, and for girls, .60, .63, .65.)

* $p < .05$, one-tailed
** $p < .01$, one-tailed

when the Year 3 PSI score was partialed out the correlations for girls from Year 2 Brown scores became positive. Also, the Year 4 Teacher-Referent Self-Esteem score continued to significantly predict third-grade math achievement scores for white middle-SES boys.

Relationship of First-Grade Measures of Achievement Motivation to Third-Grade Cognitive-Perceptual Measures for the Rural "Other Preschool" Sample

The means presented in Table 27 may be compared to the means for the rural Head Start sample in Table 9. (Since Year 3 Gumpgookies was group administered in target classrooms, no scores on it are available for the "Other Preschool" sample.) While there were no race/SES differences for rural girls in Year 4, first-grade Gumpgookies scores were significantly higher for boys in the rural Head Start sample than for boys in the rural "Other Preschool" sample ($t = 2.45$, $df = 126$, $p < .05$). This is in direct

Table 27

Means, Standard Deviations, and Predictive Correlations for Achievement Motivation Measures for the Rural "Other Preschool" Sample

Measure	Sex	Minimum n	M	SD	Third-Grade Read	Third-Grade Math	Third-Grade Raven
Year 4 Gumpgookies	B	40	50.00	7.65	.04	.01	.12
	G	33	52.91	6.24	.01	-.14	-.20
Year 4 Schaefer Task Orientation	B	39	20.77	4.95	.47**	.56**	.43**
	G	33	20.65	5.22	.12	.08	.31
Year 4 School Perception Interview Item 1	B	39	1.95	.92	.20	.29*	.12
	G	31	2.21	.93	.21	.10	.02

* $p < .05$, one-tailed
** $p < .01$, one-tailed

opposition to previous findings on the relationship of SES to achievement motivation (e.g., Adkins, Payne & Ballif, 1972). However, since Gumpgookies scores in the "Other Preschool" sample did not correlate with teacher ratings of task orientation in first grade (see Appendix Table B4) and were not predictive of later achievement, the score apparently has different meanings in the two groups. Self-reported school enjoyment (School Perception Interview Item 1) also was higher for children in the Head Start sample, with the difference for boys reaching statistical significance ($t = 2.37$, $df = 123$, $p < .05$). As was evidenced in the rural Head Start group, self-reported school enjoyment was associated with higher third-grade math scores for white middle-SES boys.

On the Schaefer Task Orientation score, which was predictive of later achievement for boys in both samples, mean scores were significantly higher for the white middle-SES "Other Preschool" boys than for the black lower-SES boys in the Head Start sample ($t = 5.58$, $df = 126$, $p < .01$), although the difference for girls was not significant ($t = 1.93$, $df = 101$, $p > .05$). Unlike the Head Start sample, in first grade the difference in Task Orientation ratings for boys and girls in the "Other Preschool" sample was not significant.[1] Although in the rural Head Start sample Year 4 Task Orientation scores were predictive for both boys and girls, in the rural "Other Preschool" sample these predictions were significant only for boys. While the failure to predict for girls might be ascribed to the low variation and high mean level in ratings in both years (see Appendix Table B4) and consequent low reliability of the ratings (the correlation of Year 4 to Year 6 ratings for this sample of girls was .00), the relatively high correlations for boys are more difficult

[1] By third grade, however, a significant sex difference favoring girls was obtained.

to explain since the Year 4 to Year 6 stability of the ratings for boys was only .15. Boys may be more likely to display the critical achievement-related behaviors in first grade enabling predictive differentiation, or first-grade teachers may be more aware of these behaviors than teachers in third grade. Moreover, young boys may be exposed to more variation in the school environment (e.g., more approval and disapproval) and/or be more susceptible to such variation.

The part correlations presented in Table 28 may be compared to the part correlations for the rural Head Start sample in Table 10. There were no significant differences between the part correlations in the two samples, with first-grade teachers' ratings of task-orientation still contributing

Table 28

Part Correlations of Achievement Motivation Measures with Third-Grade Cognitive-Perceptual Measures for the Rural "Other Preschool" Sample

Measure	Sex	Minimum n	Third-Grade Read	Third-Grade Math	Third-Grade Raven
Year 4 Gumpgookies	B	36	-.06	-.11	-.06
	G	28	.15	.00	-.06
Year 4 Schaefer Task Orientation	B	36	.37*	.44**	.24
	G	28	-.02	-.07	.17
Year 4 School Perception Interview Item 1	B	36	.26	.36*	.21
	G	28	.15	.04	-.05

Note. Year 3 PSI score is partialed out of Achievement Motivation scores. (Zero-order correlations of Year 3 PSI to Year 6 Reading, Math, and Raven scores, respectively, were as follows: for boys, .34, .40, and .57, and for girls, .60, .63, and .65.)

* $p < .05$, one-tailed
** $p < .01$, one-tailed

to the prediction of boys' third-grade reading and math achievement scores beyond what could have been predicted solely from preschool estimates of their cognitive ability.

Summary of Results for the Rural "Other Preschool" Sample

During this age period, for this sample of children, few race/SES differences emerged. The middle-SES children in the rural "Other Preschool" sample were similar to children from the rural Head Start sample in self-reported self-esteem and achievement motivation, especially once children were enrolled in Head Start. Indeed, in first grade, children in the Head Start sample tended to be slightly higher in self-reported school enjoyment and Head Start boys expressed greater achievement motivation. However, as perceived by their teachers, the task orientation of the middle-SES "Other Preschool" children was higher. Thus, children in the Head Start sample may have learned the appropriate attitudes, but not the concrete steps necessary to put those attitudes into relevant actions. It is also possible that teachers rated children according to their own SES/race expectancies and biases and were not sensitive to the children's actual behaviors. The differences in stability coefficients for the Task Orientation scores by race/SES described in Appendix B suggest there was less change in child behaviors in school for the low-SES groups, or less sensitivity in teachers in perceiving differences in children of a different status level than themselves, accompanied by greater consensus over time among teachers concerning the variables used to make their judgments of low-income black children. Except for the lack of prediction for the task-orientation ratings for the middle-SES girls, correlational patterns across the two samples were quite similar.

Chapter 6

SUMMARY AND CONCLUSIONS

In the current report, the investigation of the relationship of self-esteem and achievement motivation to cognitive-perceptual performance in children who attended Head Start focused on three questions: (1) the relationship of measures of self-esteem and achievement motivation gathered when the children were 3 1/2 to 6 1/2 years of age to reading and mathematics achievement in third grade, (2) whether such measures can improve predictions made solely from an achievement measure administered during the Head Start year, and (3) whether these predictions in the Head Start year differ depending on initial status on measures of cognitive ability, response tempo, and cooperation. A criterion measure of problem-solving ability also was included to investigate possible differential predictions when compared to the more directly school-oriented achievement measures. Supplementary analyses compared mean levels and correlations in the samples of children who attended Head Start to similar statistics in two comparison samples.

The ETS-Head Start Longitudinal Study provided the data for the study. A sample of 467 children from that study who had data on at least one of the early measures of self-esteem and achievement motivation plus scores on the cognitive-perceptual measures in third grade was selected. From this group, two samples of children who had attended Head Start were identified. One sample came from two urban northern cities in which Head Start was a prekindergarten program, and a second sample came from a basically rural southern community in which Head Start was a kindergarten level program. Since both of these samples were predominantly black, the few white children

were eliminated from all analyses in order to avoid any race confounding. One of the supplementary comparison samples consisted of urban black children with, as far as could be determined, no preschool experience, while the other comparison sample consisted of rural middle-SES white children who had attended non-Head Start preschools. The total sample, then, consisted of 467 children distributed among four subsamples. Since previous research suggested the existence of sex and race/SES differences in both mean level comparisons and patterns of intercorrelations, analyses were performed separately by sex within race/SES groups. Thus analyses were run separately for each of eight subgroups representing differing sex, preschool experience, SES, and geographical areas of classification.

The Brown IDS Self-Concept Referents Test was the measure of self-esteem used from preschool through the first grade. In first grade it was supplemented with an item from a child interview which asked the child to rate how well he thought he was doing in school. Achievement motivation was assessed in the preschool years and in first grade with Gumpgookies, which was supplemented in first grade with an interview item which asked the child how much he enjoyed school and with teacher ratings of task orientation on Schaefer's Classroom Behavior Inventory (CBI). Third-grade measures of self-esteem and achievement motivation also were included in order to provide information on stability of the earlier measures, and results for these additional measures are provided in Appendix B. Criterion achievement measures in third grade were the Reading and Math scores from the Cooperative Primary Tests, and the measure of problem-solving ability was Raven Colored Progressive Matrices. Caldwell's Preschool Inventory (PSI) was the

early measure of school-related skills. The three measures used in the moderator variable analyses were: 1) PSI total score, 2) Latency scores from the Matching Familiar Figures Test, and 3) Cooperation ratings from the Hess and Shipman Eight-Block Interaction Task. For these analyses the urban and rural Head Start samples were divided into thirds on the basis of scores obtained the spring prior to entry into Head Start.

Self-Esteem Results

Major results for the self-esteem mean scores indicated that through the first grade the self-esteem of nearly all the children in the Head Start samples and in the comparison samples was uniformly high as measured by the Brown IDS Self-Concept Referents Test and the item from the School Perception Interview. Although initially slight urban vs. rural and race/SES differences were obtained, with rural low-SES black children obtaining lower Brown scores, these site and race/SES differences were not evidenced once these children were enrolled in Head Start. This suggests that preschool teachers need not stress programs designed to improve self-esteem. However, self-esteem scores in third grade were well below ceiling levels, and there also was evidence for significant race/SES differences, at least in girls. Thus, teachers in the early elementary grades, especially teachers of economically disadvantaged children, should be particularly aware of their behaviors which may decrease the initially high levels of children's self-esteem.

It should be noted that the contradictory findings reported in the literature regarding race/SES differences in self-esteem (cf. Long, 1969; Zirkel & Moses, 1971) may reflect the impact of differences in developmental level and environmental context noted here. While not conclusive,

the current results are consistent with previous findings (Calsyn, 1973; Kifer, 1975) that differences in academic self-esteem develop as a reaction to school success and failures rather than acting as a cause of such school performance. Also, for primary grade children concurrent estimates of self-esteem were more highly related to academic achievement (Reading and Math scores) than to estimates of a more abstract problem-solving (Raven scores). Since the child is more likely to be receiving feedback in the classroom on the skills assessed by the Reading and Math tests than on the reasoning skills represented by the Raven, this finding is consistent with the notion of academic success acting as a determinant of self-esteem.

Predictive analyses with the Brown generally yielded low correlations with the third-grade cognitive-perceptual measures, although a number of the correlations were statistically significant. However, in the rural site correlations from Year 1 Brown scores to third-grade math scores were relatively substantial, accounting for about 20% of the variance in the math scores. For correlations from the Brown scores obtained during the Head Start year, there were no statistically significant correlations for urban boys or rural girls (and only one for rural boys). The highest correlation from the Head Start year scores accounted for less than 13% of the variance in any of the third-grade cognitive-perceptual scores.

For predictions from Head Start year scores, in the urban sample the Brown made no significant contribution to what could have been predicted from the PSI alone, while in the rural sample, Brown scores added slightly (though statistically significantly) to predictions of math achievement scores for rural boys (Part $\underline{r}$ = .22). Correlations from the Brown were fairly consistent over the three levels on each of the moderator variables. It

should be noted that even though a score is not predictive of third-grade achievement it may still provide valuable information. Thus, one may want to know about the self-esteem of preschool children whether or not it predicts later achievement. Because a preschool measure of self-esteem failed to improve on predictions may not mean that self-esteem is unimportant for later achievement, but only that it is already reflected in the early cognitive measures. Indeed, consistent with earlier findings (Emrick, 1972; Walker et al., 1973), there were a number of significant correlations between Brown scores and concurrent PSI scores.

Results of the internal analyses of the self-esteem scores indicated very little stability over time, perhaps in part as a function of the restricted range on the preschool measures of self-esteem and partly due to true instability in self-perceptions as increasing contact with the environment causes the child to develop a more differentiated, critical perception of self.

Achievement Motivation Results

While scores were generally fairly high, there were notable individual differences on both self-report (Gumpgookies) and teacher rating (Schaefer Task Orientation) measures of academic achievement motivation. Despite high internal consistency reliability within each year, relative rankings of the children on Gumpgookies shifted considerably from year to year, especially from Year 3 to Year 4 in the urban sites. Teacher ratings of task orientation (perseverence and concentration) suggested a low to moderate degree of stability in these behaviors from first to third grade, with girls generally receiving higher scores than boys. Reported school enjoyment was high in both first and third grades, especially among children who had attended Head Start.

Head Start year Gumpgookies scores, especially in the rural site, added significantly to predictions from a concurrent achievement measure irrespective of the child's level of preacademic skills. Thus, Gumpgookies apparently assesses achievement-related attitudes that are important for later school achievement but are not yet totally reflected in concurrent achievement measures. Since natural variation in achievement motivation as defined by the Gumpgookies test (i.e., liking school activities, feeling positive about one's self as a learner, expecting to succeed, persevering in attempts to succeed, and knowing mechanisms/tools which will enable one to succeed) appears to make a substantial independent contribution to predictions of academic success for children of high and low achievement levels, preschool programs designed to develop these attitudes might make a substantial contribution to the child's later success in school.

While there were a number of significant predictions from preschool Gumpgookies scores, especially in the rural site, by first grade Gumpgookies scores were less predictive of later achievement. Thus, there is apparently a critical period for the administration of Gumpgookies. Perhaps as children get older they are more likely to take time to think of the socially desirable response, and hence give less valid responses. This would be consistent with the apparent finding that, at least in the urban sample, scores were more valid for children with short response latencies (as measured by MFF) than for children whose style was generally to reflect on an it[illegible] before answering. Another explanation of this "critical period" is that Gumpgookies is more differentiating during the period when these attitudes are in their formative stage and children are first exposed to a major emphasis on school-oriented achievement; thus scores may reflect

also the child's readiness to assume such motivation. The significant predictions from kindergarten year Gumpgookies scores in the urban "No Preschool" sample is consistent with this interpretation.

Ratings of the children's task orientation (i.e., perseverence and concentration) by their first-grade teachers also generally correlated relatively highly with third-grade achievement, and significantly added to predictions from Head Start year achievement scores. However, correlations were not significant for boys from the urban Head Start sample or for girls from the rural "Other Preschool" sample. Although the lack of prediction for white middle-SES girls was at least in part due to their high mean ratings in both years, for urban Head Start boys it is not known whether these differences were caused by variability over time in the children themselves or by difficulties of their teachers in identifying the important signs of perseverence and concentration in these children. The results for girls in the urban Head Start sample, however, were quite striking, with correlations to later achievement in the .50's and part correlations in the .40's. Thus, preschool programs which develop perseverence and concentration might be expected to enhance subsequent achievement scores of children in these programs.

Except for children in the rural middle-SES sample, in first grade girls got significantly higher mean ratings than boys, and in the rural samples children from the white/middle-SES sample got higher ratings than children from the black/low-SES Head Start sample. (These differences were maintained in third grade with the middle-SES sample also evidencing a significant sex difference.) Comparison of scores on the various first-grade measures of achievement motivation in the urban Head Start sample to similar

scores in the urban "No Preschool" sample failed to show any advantage for children who attended Head Start. Of course, individual Head Start programs may have been very successful in fostering these behaviors. In the rural site, for example, first grade self-reported school enjoyment and achievement motivation were significantly higher for black boys who attended Head Start than for white middle-SES boys.

While self-reports by low-SES black children in first grade indicated that they enjoyed school and had high levels of achievement motivation, these positive attitudes were not reflected in their basic reading and math skills, or, especially in boys, in task-oriented behaviors as perceived by their teachers. Thus, while developing positive attitudes may be necessary for school success, it is obviously not sufficient; teachers also must provide adequate instruction on the appropriate task-related behaviors. Also, the school environment must reinforce and sustain such interest and motivation. Of course, the extent to which the teachers' perception of low-SES black children as less task oriented created an expectancy cycle of effects is unknown.

Other Results

A number of salient results also were noted in the analyses reported in Appendix B: (1) Correlations between the measures of self-esteem and achievement motivation indicated that these two constructs are related, but also assess somewhat different aspects of affective and social functioning. Early measures of self-esteem and achievement motivation showed low positive correlations, but there was little consistent patterning of the results over years; in Year 6 self-report measures of self-esteem and achievement motivation did show a moderate degree of relationship, with

teacher ratings of task orientation also related to self-reports of self-esteem. (2) While there was sufficient overlap among multiple measures of the same construct to imply some convergent validity, each instrument also was measuring something unique. (3) Predictive validities for the cognitive-perceptual measures differed significantly across the various subgroups. Correlations with third-grade performance were consistently higher in the rural white/middle-SES samples. Predictions for boys in the urban Head Start sample indicated that preschool achievement test scores for these children were essentially worthless in predicting third-grade achievement. Similarly, first-grade achievement scores in this sample were not significant predictors of later achievement. Of all of the achievement tests for the urban boys considered during the age period three-and-a-half to seven, the only one to account for more than 9% of the variance in the third-grade achievement scores was the kindergarten year Metropolitan Readiness Test. In contrast, predictions to third-grade achievement for girls in the urban Head Start sample across this same time period were equally high across the various achievement measures. Clearly, it is important to determine predictive validities separately for various sex and race/SES classifications and not to assume that validity in one sample implies validity in another. (4) The race/SES differences in stability coefficients obtained for the Task Orientation scores may reflect less change in child behaviors in school for the low-SES group, or less sensitivity in teachers in perceiving differences in children of a different status level than themselves, accompanied by greater consensus in the variables teachers use to make their judgments of low-income black children. (5) Scores on the Coopersmith Self-Esteem

Inventory (CSEI) were generally more highly related to concurrent achievement scores than were scores on the Self-Concept Referents Test. This may reflect the larger number of school-related items in the CSEI, and is consistent with previous findings (Calsyn, 1973) of higher correlations to academic achievement from measures more specifically related to academic self-esteem than from measures of general self-esteem.

Implications of Results for Evaluation of Preschool and Elementary Programs

In addition to the program implications already discussed, the present findings have several implications for the design of studies attempting to evaluate preschool and primary grade programs. First, the general low stability found for measures of self-esteem and achievement motivation investigated in this study and their different patterns of correlations across years suggest that these behaviors are undergoing considerable developmental change during this period. Thus, these measures do not lend themselves to a pre-post design which assumes constancy of meaning in the variable being assessed at both points in time. Also, designs which assume linear growth are likely to be inappropriate for assessing social and emotional functioning. Present and earlier study findings (Emmerich, 1971) suggest curvilinear developmental growth patterns for some affective and social behaviors. Thus the same behavior may have a different evaluative meaning, and consequently different correlations, at different points in time. Since feelings of self-esteem are very high during the preschool period, one would not expect increased scores with program participation. Instead, with increased maturity and cognitive growth, plus exposure to more situations and "significant others," one would expect a more differ-

entiated self perception. This developmental sequence would result in slightly lower scores.

In addition, inappropriate, misleading, or at the least, less informative data are likely to be obtained when one assumes a unitary trait is being assessed. The differential predictive validity obtained for a measure of academic self-concept vs. a more general measure of self-esteem and the low internal consistencies obtained in the present study for measures of self-esteem suggest the need for more fine-grained assessment in these areas. The present analyses suggested that the Brown IDS Self-Concept Referents Test might be more useful if items were added enabling several homogeneous item clusters to be formed which would permit one to assess status and change in one's attitudes about particular program goal-relevant aspects of one's self. While the Brown in its present form may be of some use in identifying those exceptional preschool children for whom self-esteem is low, it is not recommended as a measure of reliable individual differences on a stable trait known as "self-esteem."

The findings also indicate the need for analyses to be performed separately by sex within subgroups since different patterns of relationship for these groups were obtained. In addition, the number of significant differences found between the urban and rural samples in the current analyses suggests the importance of considering environmental characteristics that may uniquely influence results in a particular sample. Also implied by the present findings is the necessity for obtaining follow-up information at various points in time. Short-term impacts of preschool programs may be observed in different levels of achievement motivation and task orientation upon entering grade school; however, academic skills mediated by these

behaviors may not be evident until later grades. This seems particularly true for low-income children and especially so for boys.

Achievement motivation, persistence, and concentration are strong candidates for criterion measures in evaluations of preschool programs attempting to facilitate the child's school adaptation, given their substantial contribution to predicting third-grade success in reading and math. The finding that predictions to a less school-oriented measure of problem-solving ability were not as high suggests that programs designed to improve achievement motivation not be evaluated with such measures.

The differential predictive validity of preschool achievement measures obtained for estimating low-SES and middle-SES children's ability to acquire basic academic skills and the questionable validity of group-administered first-grade reading achievement tests (specifically, the Cooperative Primary Reading Test) found for low-SES children, particularly urban black boys, strongly suggest considerable caution in attempts at early identification and classification for children similar to those in this sample.

Implications of Results for Future Research

As indicated above, the present findings should contribute to our knowledge of assessment in early childhood by providing information on 1) the development of affective, social, cognitive, and perceptual processes; 2) the pattern of their interrelationships; and 3) characteristics of particular measurement techniques for children of similar background characteristics. The present study highlights, however, the need for more intensive study of these interrelationships in children of varying characteristics. Since many of the results in this report were not predicted and apparent trends were

noted even though they were not statistically significant, further studies are needed to identify which results are replicable and which represent chance findings or findings which are not generalizable to other populations.

Further analyses also are needed to explore a number of specific issues. For example, the apparently stronger association of achievement motivation to math performance than to reading performance needs to be explored. It may be that this relationship is found because math is less intrinsically motivating, instruction in math is less individualized, and/or a greater complexity of skills or necessary prior learning is involved in reading, thus leading to more reliance on cognitive-perceptual abilities and previously acquired skills. Or, it may be something unique to the particular achievement measures used in this study. Since it is known that Head Start is not a homogeneous treatment, further analyses of the data on the Head Start samples should be particularly valuable in identifying components of specific programs that contribute to the maintenance of self-esteem and development of achievement motivation.

Further study is needed to understand the development of those sex differences found so as to plan more effectively how to enhance positive effects and lessen the interference of negative ones. In particular, further analysis is needed to explain the general finding that the difference in task-orientation ratings for boys and girls increases with time in school, with girls adapting more readily to the school setting. Moreover, for girls, their early interest is sustained in the primary grades and is reflected in their acquisition of basic school skills. Boys may be more susceptible to environmental influences and/or may be exposed to greater variation in their

school experience. The data supported the general findings that affective and social variables have a somewhat greater independent influence on school performance for boys. Consistent with previous findings, urban black boys in this sample appeared to experience the most disruption on entry into grade school. Particular attention needs to be given to delineating the critical variables involved.

Further exploration (e.g., the relationship to Head Start enrollment, age of entry into school, and early grade school experiences) is needed also of the finding that urban-rural differences in both self-esteem and cognitive skills of black children in the present sample were diminished in the year following Head Start attendance in Lee County, although such differences reappeared with longer attendance in grade school. A related finding needing further study is the general drop-off in prediction obtained when children were in first grade.

We are currently in the midst of an intensive case history study of those black Head Start-eligible Longitudinal Study children who 1) obtained particularly high or low third-grade Math or Reading test scores or 2) deviated most from estimates of third-grade academic achievement as predicted by performance on the Preschool Inventory at age four. These data should provide important clues to understanding the present findings by delineating relevant variables so as to understand individual differences, psychologically defined, rather than static group differences. Thus age or sex becomes significant only insofar as we understand the associated variables that help explain particular interactions such as those embodied in the classroom teacher's differential use of praise and blame. Similarly, socioeconomic status is important to the extent that we delineate the

component variables associated with the term and use them as individual predictors within socioeconomic levels. Moreover, further insight should be provided on the nature of the child's home and school environment and their interactive effects upon the child's self-esteem, achievement motivation and academic success.

Conclusions

As the present findings indicate, affective and social behaviors interact in the acquisition and performance of cognitive skills. Assignment of tasks to the "cognitive" domain, however, does not imply they are independent of motivation. For the young child especially, one cannot completely separate intellective and non-intellective factors. Specifically, motivational factors cannot be separated from the learning process. In previous analyses of the test data gathered when study children were four years old, measures of persistence and cooperation loaded on the general ability dimension. Although there was probably insufficient sampling of such behaviors in the test battery to produce factors in the affective domain, the affective domain may not be highly differentiated at this age, particularly to the extent that such behaviors are mediated by cognitive growth. In the present analyses those preschool-age children who had higher PSI scores also reported greater self-esteem and achievement motivation and were rated as more attentive and cooperative in the mother-child interaction session observed earlier. Similarly, data obtained in Year 6 from the Coopersmith Self-Esteem Inventory also suggested interaction among positive attitudes in the school setting, task orientation and academic achievement.

The present findings suggest, moreover, that the encouragement of certain affective and social behaviors, that is, achievement motivation,

persistence, and concentration during the preschool years, may act to facilitate the child's acquisition of the basic academic skills of reading and mathematics. It is particularly noteworthy that regardless of whether the child's general problem-solving ability is increased, he can succeed in acquiring these skills. Also, within a broad range of entering cognitive skills, these social and emotional skills can contribute substantially to cognitive and perceptual growth in school. However, the generally positive achievement attitudes of children in these black/low SES populations were often not evidenced in observable task-oriented behaviors or in actual achievement scores, suggesting the need for additional efforts in the primary grades to ensure that positive attitudes are reinforced, sustained, and translated into facilitating behaviors. Indeed, despite the positive attitudes noted in the current samples, the familiar "fan spread" phenomenon was evident, with black/low-SES children falling progressively further behind white/middle-SES children.

Although a few possible differential trends were noted, in general the predictions were fairly consistent across different levels of the children's cognitive ability, response tempo, and cooperation assessed prior to entry into Head Start. The potentially moderating influence of specific preschool programs, however, should be explored in future analyses. Thus, comparisons of the urban Head Start and "No Preschool" samples in the current report should be made particularly cautiously, not only because of the small size of the "No Preschool" sample, but also because the current analyses could not identify differentially effective preschool programs.

Replication of the major correlational findings across site, race, SES, and preschool attendance categories provided evidence for the stability of

relationships across children with very different background characteristics. A number of race/SES differences in both mean levels and correlational patterns were observed, however, particularly the difficulty in making predictions from cognitive measures in the sample of urban boys. However, it is perhaps more important to note the range of response evidenced within the black/low-SES samples. The substantial variation within this population on measures of achievement motivation and cognitive-perceptual performance, even within sex and geographic categories, demonstrates the folly of considering low-income black children as a homogeneous group.

The current analyses provided some hint as to the vast complexity in the relationship among affective, social and cognitive processes. There is a strong need for further analyses of these data as well as future replication efforts in order to more clearly define those complex processes affecting the present findings.

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APPENDIX A

Child Test Batteries

Years 1, 2, 3, 4 and 6

Year 1 - Testing Sequence

Lee County, Portland, and Trenton

Day 1

Mother-Child Interaction tasks:

Toy Sorting
*Eight-Block Sorting
Etch-A-Sketch

Motor Inhibition Test
ETS Matched Pictures I

Battery A	Estimated Time (in minutes)
*Preschool Inventory (Caldwell)	20
Vigor I (Running)	5
Spontaneous Numerical Correspondence	5
Massad Mimicry Test	10
Rest-Play	10
TAMA General Knowledge Test I	10
Risk-Taking	20
Picture Completion (WPPSI)	5
Battery B	
Sigel Object Categorizing Test	25
Mischel Technique	5
John Hopkins Perceptual Test	15
Open Field Test	10
ETS Story Sequence Test I	20
Seguin Form Board	5
*Matching Familiar Figures Test	15
Battery C	
Fixation	20
Vigor 2 (Crank-turning)	5
Brown IDS Self-Concept Referents Test	10
Preschool Embedded Figures Test	15
Rest-Play	10
Children's Auditory Discrimination Inventory	15
Peabody Picture Vocabulary Test	15
Boy-Girl Identity Task	5
Enumeration I	5

Year 2 - Testing Sequence

Portland and Trenton

Battery A	Est. Time (In Minutes)
No measures included in present report.	
Battery B	
Sigel Object Categorizing Test	20
Vigor 2 (Crank-turning)	5
Fixation Time	20
Naming Category Instances	15
Rest-play	(5)
Peabody Picture Voc. Test, ETS Adaptation, Forms A & B	20
Spontaneous Numerical Correspondence	5
*Gumpgookies	25
Seguin Form Board	5
*Brown IDS Self-Concept Referents Test (Self and Teacher)	15
Battery C	
TAMA General Knowledge Test II	10
*Preschool Inventory (Caldwell)	20
Form Reproduction	5
Mischel Technique	2
Johns Hopkins Perceptual Test	15
ETS Matched Pictures II	10
Open Field Test	(10)
Relevant Redundant Cue Concept Acquisition Task	15
Social Schemata	15
Matching Familiar Figures Test	15
Enumeration II	5
Spatial Egocentrism Task	15

Lee County

Battery A	Est. Time (In minutes)
No measures incluced in present report.	
Battery B	
Peabody Picture Vocabulary Test, ETS Adaptation, Forms A and B	20
*Brown IDS Self-Concept Referent Test (Self only)	10
Battery C	
*Preschool Inventory (Caldwell)	20
Johns Hopkins Perceptual Test	15
ETS Matched Pictures Language Comprehension Test II	10
*Matching Familiar Figures Test	15
Enumeration Task II	5

* Measure included in present report.

Year 3 - Testing Sequence

Lee County

Battery A	Est. Time (In minutes)
No measures included in present report.	

Battery B	
ETS Matched Pictures II	5
Block Design (WPPSI)	10
Sigel Categorizing Test	17
Boy-Girl Identity Task	5
(Rest)	(5)
Massad Mimicry Test II (Revised)	15
Vigor 2 (Revised)	5
ETS Story Sequence Test III	12
*Brown IDS Self-Concept Referents Test (Self and Teacher)	15
Test Situation Ratings	

Battery C	
Spontaneous Numerical Correspondence and Conservation	10
*Preschool Inventory (Caldwell)	20
Form Reproduction Task	5
Locus of Control Picture Story Test	10
(Rest)	(5)
Matching Familiar Figures Test II	10
Social Schemata	5
Picture Completion Test (WPPSI)	5
Auditory Discrimination Test (Wepman)	8
ETS Enumeration Task III	10
Risk-taking 2	3
Test Situation Ratings	

Portland and Trenton

Test Battery	Est. Time (In minutes)
ETS Matched Pictures Language Comprehension Task II	5
Preschool Embedded Figures Test	17
Boy-Girl Identity Task	4
Matching Familiar Figures Test II	10
Sigel Categorizing Test	15
Motor Inhibition Test (Revised)	5
ETS Story Sequence Test III	12
ETS Enumeration Task III	10
*Brown IDS Self-Concept Referents Test (Self and Teacher)	12
Test Situation Ratings	--

* Measure included in present report.

Year 4 - Testing Sequence

Lee County and Portland

Battery A	Est. Time (In minutes)
*Raven Colored Progressive Matrices	13
Naming Category Instances	15
*Gumpgookies	14
Sticker Task (House)	8
(Rest)	(5)
ETS Spatial Egocentrism Task III	12
Children's Embedded Figures Test	15
Motor Inhibition Test (Revised)	5

Battery B	
ETS Test of Linguistic Structures	12
Block Design (WISC)	9
Sticker Task (Tree 1)	8
Sigel Categorizing Test	15
Boy-Girl Identity Task	4
(Rest)	(5)
Massad Mimicry Test II (Revised)	12
Auditory-Visual Integration	8
*School Perception Interview	12
Sticker Task (Tree 2)	8

Battery C	
Spontaneous Numerical Correspondence and Conservation	10
Stanford Memory Test	8
Bender-Gestalt Test	10
Locus of Control Picture Story Test	10
(Rest)	(5)
Matching Familiar Figures Test III	9
Social Schemata	5
Picture Completion Test (WISC)	7
Auditory Discrimination (Wepman)	8
*Brown IDS Self-Concept Referents Test (Self and Teacher)	15

Note. Test Situation Ratings also were obtained for each battery.

* Measure included in present report.

Year 4 - Testing Sequence

Trenton

Test Battery	Est. Time (In minutes)
Children's Embedded Figures Test	15
Boy-Girl Identity Task	4
Matching Familiar Figures Test	9
Sigel Categorizing Test	12
Motor Inhibition Test (Revised)	4
*Raven Colored Progressive Matrices	13
*School Perception Interview	12
Naming Category Instances	12
*Brown IDS Self-Concept Referents Test (Self and Teacher)	15
Test Situation Ratings	--

* Measure included in present report.

Year 6 - Testing Sequence

Lee County, Portland, and Trenton

Battery A	Est. Time (In minutes)
ETS Spatial Egocentrism Task	10
Block Design (WISC)	9
Digit Span (WISC)	5
Sticker Task I (Revised)	5
Sigel Categorizing Test	12
Motor Inhibition Test	4
What Can You Use It For?	10
Picture Completion Test (WISC)	7
*School Perception Interview	12
Children's Embedded Figures Test	15
Story Sequence Test IV	10
Sticker Task II (Revised)	5

Battery B	
*Raven Colored Progressive Matrices	13
Naming Category Instances II	12
Bender-Gestalt Test	10
Stanford Memory Test - Short Term Series	8
Locus of Control Picture Story Test	10
Stanford Memory Test - Delay Series	4
Matching Familiar Figures Test IV	9
What Could It Be?	10
Auditory-Visual Integration Test	8
*Self-Concept Referents Test (Self and Mother)	13

Note. Test Situation Ratings also were obtained by task and battery.

*Measure included in present report.

APPENDIX B

Results of Internal and Within-Domain Analyses

Results of Internal and Within-Domain Analyses

In this chapter the findings within the affective, social, and cognitive-perceptual domains are presented. First, the characteristics of the various measures of each construct in the affective and social domains are described, including information on their internal consistency, stability over time, and distributional properties. Where appropriate, a brief nontechnical summary of key findings precedes the more detailed analyses of the measures for each construct. Following the analysis of the individual instruments, the relationships among the various measures of each construct is presented. Then, the relationship among the measures from the various areas of the affective-social domain is described. Findings for the cognitive-perceptual domain are then presented in a similar fashion.

Characteristics of the Measures of Self-Esteem

Self-esteem scores during the age period four to seven were uniformly high, although by age 8 1/2 to 9 substantial variation was evident. Stability of the scores from year to year was generally very low; this was undoubtedly partly due to the restricted range of the early scores, but also may indicate that early self-esteem is very susceptible to subsequent environmental influences.

Brown IDS Self-Concept Referents Test (and ETS Revision). Consistent with previous findings (Brown, 1966; Walker, et al., 1973), children in both the larger Longitudinal Study sample and the current sample had a strong tendency to select the socially desirable attribute so that the scores had a strongly negative skew, with mean adjusted scores of over 79% for all subgroups in Years 1, 2, and 3, and mean total scores greater than 12 (out of 14) in Year 4. For additional evidence of this tendency to pick the socially

desirable alternative, the proportion of children in each subgroup selecting the keyed alternative for each item was inspected. In Year 2 most of these proportions were in the .80's and .90's, with a low of .58 over all items in all subgroups. In Years 3 and 4 this tendency became even more pronounced, with nearly all proportions in the .90's, except for Item 5 on which the keyed alternative was selected by a little more than half the children in Year 3 and by less than half of the children in Year 4. Item 5 asks, "Does (child's name) like to talk a lot or doesn't he (she) like to talk a lot?" Liking to talk is scored as the choice representing positive self-esteem. But while talking may be encouraged in preschool, the child probably perceives that it is not considered socially desirable in the grade school setting where the testing took place. By Year 6, most children were choosing an intermediate alternative for the "like to talk" item with the mean falling between "pretty much" and "a little bit."

Table B1 presents correlations among the "self" and "other" referent scores along with means and standard deviations for each score and across-year stability coefficients. Since Head Start was a kindergarten-level program in the rural site, most children in that site were not enrolled in preschool programs in Year 2, and hence were not asked the teacher-referent items; in the urban sites n is reduced because only children actually in preschool classes were asked the teacher-referent items.

As is suggested by the means presented in Table B1, the Year 6 scores did not have the ceiling problems of the earlier bipolar Brown scale. Indeed, the means were closer to the midpoint of the scale (35) than to its maximum value of 56. It is unclear whether this less skewed distribution reflects a more differentiated, critical view of self with increased maturity

Table B1

Means, Standard Deviations and Stability Coefficients for Self-Concept Referents Test

		Min. n	M	SD	2S	2T	3S	3T	4S	4T	6S	6M
Year 1	UHSB	60	.85	.14	03	10	06	-01	07	-12	02	37
Brown	UHSG	50	.82	.15	12	00	-04	01	14	03	-05	-01
Self-Referent	RHSB	63	.79	.15	23		-01	28	-05	-09	21	12
(1S)	RHSG	50	.79	.17	23		03	24	-05	03	18	-05
	UNB	20	.83	.17	60		29	32	22		15	14
	UNG	26	.83	.15	09		14	-10	23	28	-03	20
	RPB	23	.86	.14	15	-10	07	04	08	31	16	07
	RPG	28	.88	.15	-20		24	15	-11	-18	-38	-33
Year 2	UHSB	66	.88	.12		64	21	24	07	-02	19	26
Brown	UHSG	58	.86	.12		68	19	22	03	11	07	03
Self-Referent	RHSB	79	.80	.13			05	12	21	26	00	03
(2S)	RHSG	64	.81	.13			19	26	-23	13	11	-05
	UNB	20	.87	.15			61	59			06	26
	UNG	25	.90	.07			05	-21	38	19	13	01
	RPB	25	.88	.11		77	19	29	32	30	11	-08
	RPG	27	.91	.08			-11	09	04	20	03	-10
Year 2	UHSB	59	.86	.14			13	13	-11	-14	14	33
Brown	UHSG	55	.84	.14			11	20	11	37	-03	-05
Teacher-Referent (2T)												
Year 3	UHSB	79	.91	.08				65	15	11	12	18
Brown	UHSG	71	.89	.11				71	34	36	01	11
Self-Referent	RHSB	87	.88	.11				53	15	-02	23	07
(3S)	RHSG	69	.88	.12				60	13	16	-06	-01
	UNB	21	.92	.07				75	-10		-13	08
	UNG	31	.92	.08				50	15	25	33	48
	RPB	33	.89	.10				61	46	21	37	15
	RPG	30	.92	.08				75	52	34	26	-02
Year 3	UHSB	78	.90	.09					13	08	20	17
Brown	UHSG	71	.89	.11					31	30	-02	00
Teacher-	RHSB	87	.87	.13					03	10	27	19
Referent	RHSG	69	.86	.14					09	17	07	03
(3T)	UNB	21	.92	.11					-25		-11	16
	UNG	30	.94	.09					-24	07	31	26
	RPB	33	.92	.11					23	-02	35	12
	RPG	30	.92	.08					24	24	12	-10
Year 4	UHSB	83	12.67	1.42						58	14	08
Brown	UHSG	74	12.61	1.17						50	-01	-11
Self-Referent	RHSB	74	12.53	1.52						58	17	-02
(4S)	RHSG	71	12.42	1.73						60	19	27
	UNB	21	12.70	1.29						86	47	23
	UNG	31	12.82	1.18						65	13	-04
	RPB	40	12.52	1.54						71	30	17
	RPG	34	12.71	1.31						57	34	10
Year 4	UHSB	83	12.91	1.26							12	05
Teacher-	UHSG	74	12.61	1.66							-05	-10
Referent	RHSB	88	12.64	1.46							16	10
(4T)	RHSG	71	12.46	1.55							32	31
	UNB	20	12.67	1.49							46	23
	UNG	31	12.82	1.04							21	14
	RPB	40	12.55	1.63							17	00
	RPG	34	12.47	1.83							21	01
Year 6	UHSB	88	36.74	5.31								72
Self-Referent	UHSG	76	36.75	5.61								65
(6S)	RHSB	89	36.84	5.51								71
	RHSG	72	35.67	4.87								65
	UNB	27	38.33	5.82								77
	UNG	33	38.48	5.60								76
	RPB	41	38.22	5.18								78
	RPG	35	38.71	4.70								66
Year 6	UHSB	88	39.33	5.87								
Mother-	UHSG	76	40.39	5.53								
Referent	RHSB	89	38.93	6.95								
(6M)	RHSG	72	39.28	6.11								
	UNB	27	40.41	6.49								
	UNG	33	40.67	5.57								
	RPB	41	42.34	5.29								
	RPG	35	42.86	4.75								

Note. Underlined entries significant beyond .05 level, two-tailed.
UHSB = Urban Head Start Boys; UHSG = Urban Head Start Girls;
RHSB = Rural Head Start Boys; RHSG = Rural Head Start Girls;
UNB = Urban No Preschool Boys; UNG = Urban No Preschool Girls;
RPB = Rural Other Preschool Boys; RPG = Rural Other Preschool Girls.

Abbreviations are listed in Appendix C.

or whether it is due solely to the change in test format. The latter explanation seems at least partially valid for Year 4 to Year 6 comparisons since, as was indicated earlier, a number of children in Year 4 indicated a desire to qualify a response to one of the bipolar extremes.

Coefficient alpha reliabilities within self-referent and teacher (or mother)-referent scales generally ranged from the mid .40's to the mid .60's, with no indication of systematic changes across years. However, teacher (or mother)-referent alphas consistently were slightly higher than self-referent alphas. This may indicate that the children's self-concept was more differentiated than their perception of how others perceived them, or it may simply indicate increasing consistency with practice since the teacher (or mother)-referent items were always administered after the self-referent items. In future research this ordering effect could be counterbalanced, although it might add to the complexity of the task and reduced validity of the self-referent score for the child to respond first as he perceives someone else thinks. Responses to the "other" referent items also may reflect the child's perception of the other's general regard for him, thus contributing to a more consistent report.

Considering the generally low internal consistency of the scales, the correlations within each year between self-referent and teacher (or mother)-referent scores were quite high. This suggests that children either perceive themselves as they think their teacher (or mother) does, or that they simply cannot comprehend the distinction but answer anyway. In Year 6, as in prior years, urban vs. rural differences on the Year 6 Self-Concept scores were slight, as were the race/SES differences between boys in the two rural

samples. However, white/middle-SES girls in the rural site scored significantly higher than the lower-SES black girls in the Head Start sample (t = 3.10, df = 105, $p < .01$). The general cross-year stability of the self-concept scores must be considered quite low, with few correlations greater than .40, and many even falling short of statistical significance. Note, for example, no more than three of the eight subgroups showed significant correlations across a one-year interval for any of the self-referent scores, and there was no stable pattern for any subgroup.

The instability of self-esteem scores in this age range cannot necessarily be taken as evidence of poor test validity since self-esteem itself may be very unstable in the early years. Furthermore, with the extreme skew in the scores a change in response to just a few items could move a child from the top of the distribution to the bottom or vice versa, leading to a low cross-year stability coefficient. However, by other criteria the scores could be considered quite stable (i.e., scores were stable because nearly all children got very high scores across Years 1 through 4). This stability of group responses at a high level may be much more important than the instability of relative position among children who are essentially all high-scorers. The low stability coefficient does indicate, however, that the Brown (and perhaps other preschool measures of self-regard concerning diverse aspects of self) should not be used as a measure of individual differences on a stable trait known as "self-esteem."

School Perception Interview--Item 21. As is evident in Table B2, the distribution of scores on this item in both Years 4 and 6 also was strongly negatively skewed, with means approaching the maximum value of 4. Scores were slightly less extreme in Year 6. Children in all subgroups indicated

Table B2

Correlations Among Measures of Self-Esteem

Measure	Group	Min. n	M	SD	1S	2S	2T	3S	3T	4S	4T	6S	6M	4SP 21	6SP 21
Year 4	UHSB	64	3.70	.69	-06	-17	-10	07	04	00	-14	-15	-12		
School	UHSG	57	3.76	.59	-03	-06	02	29	12	24	19	03	04		
Perception	RHSB	79	3.84	.45	-05	-11	--	09	08	-14	-12	-06	-04		
Item 21	RHSG	66	3.74	.61	-13	-23	--	-11	-26	08	06	-02	12		
(45P)	UNB	20	3.48	.90	25	04	--	06	19	40	53	31	28		
(21)	UNG	25	3.82	.39	28	-39	--	10	04	-05	04	-19	00		
	RPB	25	3.35	.83	23	26	35	10	18	55	52	12	06		
	RPG	28	3.59	.56	-10	-02	--	-13	-17	28	15	20	15		
Year 6	UHSB	63	3.45	.64	07	-11	-24	-07	08	18	19	06	04	04	
School	UHSG	57	3.49	.53	20	-06	-22	-27	-22	-11	-26	19	26	-12	
Perception	RHSB	79	3.47	.64	04	25	--	06	03	08	03	09	22	-02	
Item 21	RHSG	66	3.65	.54	07	-08	--	03	14	22	17	24	28	08	
(6SP)	UNB	20	3.59	.64	-07	-17	--	-37	-16	22	06	42	21	15	
(21)	UNG	25	3.48	.62	27	15	--	14	-10	29	21	33	48	25	
	RPB	25	3.39	.54	39	04	08	33	23	22	27	41	42	30	
	RPG	29	3.40	.50	-04	06	--	34	18	27	21	57	46	19	
Year 6	UHSB	59	24.68	6.60	19	-08	01	15	22	07	-02	41	32	07	13
Coopersmith	UHSG	54	25.81	6.01	16	25	18	-14	-21	-08	-07	48	46	-07	26
(6C)	RHSB	65	25.31	5.98	25	38	--	04	15	28	32	30	39	-13	-11
	RHSG	61	26.33	6.16	11	08	--	14	07	-03	11	-09	07	02	-05
	UNB	20	25.36	5.77	39	--	--	27	13	20	08	25	49	02	33
	UNG	27	26.26	5.71	02	37	--	13	-04	11	11	45	37	17	32
	RPB	23	28.30	6.17	00	-09	--	-06	-03	01	07	49	47	28	32
	RPG	21	30.78	6.38	08	15	--	17	-05	46	38	40	23	20	16

Note. Decimal points omitted. Underlined entries significant beyond the .05 level, two-tailed.

that they were doing well in their school work. None of the cross-year stability coefficients were significant, but, as with the Brown, the fact that the relative ordering of the children varies from year to year is probably less significant than the high overall level of self-appraisal in both years.

Coopersmith Self-Esteem Inventory (CSEI). Means and standard deviations for the CSEI are presented in Table B2. Scores for the present sample approximated a normal distribution, indicating that scores on a two-alternative self-esteem measure need not be highly skewed. Alpha reliabilities in the .70's to low .80's indicated that this was a relatively homogeneous scale. The middle-SES white children in the rural "Other Preschool" sample tended to have higher scores than children in the rural Head Start sample; this was true both for boys ($t = 2.09$, $df = 93$, $p < .05$), and for girls ($t = 2.94$, $df = 87$, $p < .01$). Thus, at least for 8 1/2- to 9-year-old girls, race/SES differences were found on both the Self-Concept Referents Test and on the CSEI. Although boys tended to have lower mean scores, no significant sex differences within samples were obtained.

Interrelationships of Measures of Self-Esteem

Correlations among the measures of self-esteem are presented in Table B2. Given the uniformly high estimates of self-esteem on most of the measures and their low stabilities across years, it is not surprising that their intercorrelations were generally low. The similar pattern of correlations for the self- and mother-referent scores provides additional evidence that the distinction between these two scores may not be a meaningful one. Despite the skewed distribution, Year 6 School Perception Item 21 scores

were significantly related to Year 6 Self- and/or Mother-Referent scores for all groups except urban Head Start males. The measures for which an approximately normal distribution of scores was obtained, Year 6 Self- or Mother-Referent and Year 6 CSEI, were significantly correlated in all groups except girls in the rural Head Start sample. However, the moderate size of the correlations indicates that the measures are related but are not totally redundant.

Characteristics of the Measures of Achievement Motivation

While scores were generally fairly high, there were notable individual differences on both self-report (Gumpgookies) and teacher rating (Schaefer Task Orientation) measures of academic achievement motivation. Despite high internal consistency reliability within each year, relative rankings of the children on Gumpgookies shifted considerably from year to year, especially from Year 3 to Year 4 in the urban sites. Teacher ratings of task orientation (perseverence and concentration) suggested a low to moderate degree of stability in these behaviors from first to third grade, with girls generally receiving higher scores than boys. Reported school enjoyment was high in both first and third grades, especially among children who had attended Head Start.

Gumpgookies. Consistent with previous findings (Adkins & Ballif, 1970), Gumpgookies raw scores had a negative skew, with means of 52-57 out of 75 in Years 2 and 3, and 50-54 out of 60 in Year 4. However, while skewed, the scores did not exhibit the serious ceiling effects of the Brown IDS Self-Concept Referents Test. As described in the main text, for correlational analyses the scores were normalized with the mean set at 50 and the standard deviation at 10. Means, standard deviations, and stability coefficients for

the various subgroups are reported in Table B3. Note that Year 2 Gumpgookies was not administered in Lee County, and in Year 3 it was group administered only in target classrooms. The Year 2 to 3 stability coefficients were significant for boys only, while the Year 3 to 4 stability coefficients were significant only for rural boys; the Year 2 to 4 coefficients were not significant for boys or girls. The stability coefficients were generally low, considering the high within-year internal consistency of Gumpgookies (alphas in the .80's to .90's). Since little

Table B3

Means, Standard Deviations, and Stability Coefficients for Gumpgookies

Measure		Minimum n	M	SD	Year 2	Year 3
Year 2 Gumpgookies (2G)	UHSB	70	52.70	10.87		
	UHSG	65	52.29	9.89		
	UNB	21	52.38	10.74		
	UNG	24	55.21	9.08		
Year 3 Gumpgookies (2G)	UHSB	38	56.85	10.56	37	
	UHSG	37	54.42	11.35	21	
	UNB	18	59.74	7.89	--	
	UNG	18	62.11	6.14	--	
	RHSB	74	53.73	11.14	--	
	RHSG	61	56.28	10.48	--	
Year 4 Gumpgookies (4G)	UHSB	43	49.89	9.00	19	11
	UHSG	44	52.93	6.70	23	17
	UNB	21	50.42	10.68	--	--
	UNG	25	54.50	4.10	--	--
	RHSB	74	53.32	5.29	--	56
	RHSG	60	54.34	5.13	--	23
	RPB	40	50.00	7.65	--	--
	RPG	34	52.91	6.24	--	--

Note. Decimal points omitted. Underlined entries significant beyond the .05 level, two-tailed.

variance is shared across years, the pattern of intercorrelations of Gumpgookies with other variables could be quite different each year, possibly indicating developmental changes in the meaning of achievement motivation during early childhood.

Schaefer Task Orientation. Means, standard deviations, and stability coefficients for this score are presented in Table B4. Mean scores, while generally toward the high end of the scale, were sufficiently below the maximum possible score of 25 to provide adequate measurement. Although Year 6 mean ratings for white/middle-SES girls were higher, ratings for the other subgroups were lower (except for rural Head Start boys which remained at the same relatively low level), suggesting either a decline in the children's task orientation or the application of stricter standards by teachers in the higher grade level. Unlike first grade where there was a race/SES difference only for boys, in third grade the difference was present also for girls ($t = 4.59$, $df = 91$, $p < .01$). Again black girls were rated higher than boys in the urban and rural sites. In Year 6 a significant sex difference for the white/middle-SES Lee County sample also emerged ($t = 3.37$, $df = 69$, $p < .01$). Earlier Longitudinal Study findings (Emmerich, 1971) indicated similar sex differences in observer ratings of free play behavior in urban preschool classes.

Stability coefficients for all except the white/middle-SES subgroups were reasonably high considering that different teachers at a more advanced grade level might after a period of two and a half years be exposed to quite different child behaviors. Combining over all subgroups in the current sample the stability of the Task Orientation score was about .40.

Table B4

Correlations Among Measures of Achievement Motivation

		Min n	M	SD	2G	3G	4G	4S TO	6S TO	4SP 1
Year 4 Schaefer Task Orientation (4S-TO)	UHSB	46	16.23	5.67	14	16	02			
	UHSG	43	18.67	5.52	18	19	-30			
	RHSB	74	14.88	6.58	--	30	18			
	RHSG	59	18.48	5.63	--	33	13			
	UNB	22	18.65	5.26	--	--	04			
	UNG	24	20.41	5.02	27	--	-08			
	RPB	34	20.77	4.95	--	--	24			
	RPG	34	20.65	5.22	--	--	21			
Year 6 Schaefer Task Orientation (6S-TO)	UHSB	46	13.29	5.24	05	13	20	28		
	UHSG	44	15.85	6.15	-05	13	-11	52		
	RHSB	71	14.92	5.97	--	16	12	30		
	RHSG	60	17.77	6.31	--	42	09	37		
	UNB	21	14.79	5.75	27	--	32	33		
	UNG	24	18.34	6.28	57	--	06	42		
	RPB	38	19.07	4.84	--	--	-10	15		
	RPG	33	22.38	3.38	--	--	13	00		
Year 4 School Perception Item 1 (4SP-1)	UHSB	46	2.61	.71	-11	21	30	09	19	
	UHSG	44	2.59	.75	-06	-17	04	-17	04	
	RHSB	72	2.36	.84	--	21	29	05	19	
	RHSG	59	2.49	.83	--	23	22	-03	26	
	UNB	21	2.74	.62	--	--	01	-08	16	
	UNG	23	2.70	.64	03	--	-13	22	08	
	RPB	38	1.95	.92	--	--	17	-01	12	
	RPG	32	2.21	.93	--	--	18	29	20	
Year 6 School Perception Item 1 (6SP-1)	UHSB	42	3.37	.88	07	08	08	-08	-11	-07
	UHSG	43	3.32	.87	30	24	-16	04	21	-09
	RHSB	65	3.61	.74	--	12	10	08	18	40
	RHSG	63	3.58	.77	--	05	11	33	15	36
	UNB	20	3.64	.76	--	--	10	21	36	-19
	UNG	22	3.47	.80	-16	--	24	12	-01	02
	RPB	31	2.84	.81	--	--	-03	-06	50	15
	RPG	31	3.15	.87	--	--	-09	-22	01	-08

Note. Decimal points omitted. Underlined entries significant beyond the .05 level, two-tailed.

On a different version of the CBI Schaefer (1975) found a stability of .52 for the Task Orientation score. For the white/middle-SES subgroups, however, scores in Years 4 and 6 were not significantly correlated. This is in part due, at least for white/middle-SES girls, to the high mean level and low variation in Year 6 ratings. These differences in stability coefficients by race/SES also may reflect less change in child behaviors in school for the low-SES group or less sensitivity in teachers to perceiving differences in children of a different status level than themselves accompanied by greater consensus in the variables teachers use to make their judgments of low-income black children.

School Perception Interview--Item 1. Means, standard deviations, and stability coefficients for this item also are presented in Table B4. Recall that in Year 4 a 3-point scale was used, while a 4-point scale was used in Year 6, thus the apparent increase in means is simply an artifact. In both years scores were negatively skewed, indicating generally positive expressed attitudes toward school. In Year 6, in Lee County black/low-SES boys again indicated they liked school better than did white/middle-SES boys ($t = 4.48$, $df = 94$, $p < .01$), and the same pattern was true of girls in Lee County ($t = 2.34$, $df = 92$, $p < .05$). This may signify greater school enjoyment by black children or that white children simply felt more comfortable expressing dissatisfaction to an adult tester at school. The cross-year stability coefficients were significant only for children in the rural Head Start sample, but as noted previously, stability coefficients may lack meaning for such skewed distributions.

Interrelationships Among Measures of Achievement Motivation

The across-year shift in meaning of Gumpgookies scores is suggested in Table B4. There was no significant positive correlation between Year 4

Gumpgookies and either Year 4 or Year 6 Task Orientation ratings in any of the eight subgroups. Whatever it was that Year 4 Gumpgookies was measuring, it was not related to teacher judgments of task orientation. While there were scattered significant correlations, reported school enjoyment (School Perception Interview--Item 1) in Years 4 and 6 was generally unrelated to the other measures of achievement motivation.

Relationships Among Measures of Self-Esteem and Achievement Motivation

Correlations between the measures of self-esteem and achievement motivation are presented in Table B5. Due to the ceiling problems with the Brown scores for Years 1 through 4 and the similar ceiling problem with both items from the School Perception Interview, it was not surprising to find generally low correlations for comparisons that included these measures. An exception to this generalization was the relationship of the Year 2 Self-Referent score to Year 2 Gumpgookies responses and the relationship of the Year 6 Mother-Referent Self-Esteem score to responses to the Year 6 school enjoyment item (School Perception Interview--Item 1), with significant correlations in three out of the four and five out of the eight subgroups, respectively. However, response to Item 1 was not related to the Coopersmith Self-Esteem Inventory (CSEI) scores. Performance on the CSEI was significantly related to the Year 6 Schaefer Task Orientation ratings, although there was some variation in the pattern of relationships across subgroups. While there were a number of significant correlations with Gumpgookies within and across years, there was little consistent patterning in the results. In general, then, there was an indication that at least within Year 6, self-report measures of self-esteem and achievement motivation show a moderate degree of relationship, with teacher ratings of task orientation also related to self-reports of self-esteem.

Table B5

Correlations Between Measures of Self-Esteem and Achievement Motivation

		Min. n	1S	2S	2T	3S	3T	4S	4T	6S	6M	4SP 21	6SP 21	6C
Year 2 Gumpgookies	UHSB	62	10	15	27	03	-04	-02	-06	07	17	-16	-09	04
	UHSG	55	19	33	30	11	06	04	-08	19	29	31	22	32
	UNB	20	10	45	--	27	34	--	--	32	47	--	-39	--
	UNG	22	-13	43	--	42	-11	-08	04	-20	04	-21	-15	15
Year 3 Gumpgookies	UHSB	34	01	13	-10	20	25	-03	16	-17	-16	-02	20	-19
	UHSG	32	29	40	20	-01	03	08	17	12	14	13	12	14
	RHSB	56	32	06	--	17	42	06	08	43	33	-23	18	26
	RHSG	56	49	18	--	-20	12	-04	19	08	05	04	-21	32
Year 4 Gumpgookies	UHSB	59	32	01	06	14	05	-02	-03	18	21	-02	14	29
	UHSG	50	06	15	28	01	07	-02	08	-17	04	12	04	02
	RHSB	64	23	-01	--	-01	20	06	22	28	23	10	08	22
	RHSG	64	15	25	--	-04	05	00	05	-04	-02	-02	-21	30
	UNB	20	-19	--	--	-24	-27	-25	02	-05	02	07	-20	00
	UNG	20	-53	-07	--	-16	08	-26	-30	12	10	-19	-02	-18
	RPB	25	-09	20	27	17	52	24	25	23	18	45	20	10
	RPG	22	-12	44	--	12	09	22	01	11	04	09	21	18
Year 4 Schaefer Task Orientation	UHSB	62	09	06	21	16	21	-13	-10	03	-08	-03	-05	24
	UHSG	52	07	23	30	-19	-21	23	12	26	19	08	-01	49
	RHSB	65	10	10	--	-06	13	23	24	11	19	12	14	25
	RHSG	51	22	11	--	-02	-08	-13	-02	13	11	15	-07	21
	UNB	20	-22	--	--	-14	-22	47	52	24	00	-14	22	16
	UNG	27	22	54	--	21	12	02	04	38	39	-05	30	41
	RPB	25	14	-04	-17	12	05	10	23	-16	-08	31	03	01
	RPG	22	05	09	--	33	30	06	12	07	-09	06	22	13
Year 6 Schaefer Task 0 Orientation	UHSB	64	09	14	18	08	02	-14	-01	33	12	-08	03	24
	UHSG	55	11	12	03	00	-11	17	15	14	19	-03	01	43
	RHSB	64	31	03	--	-04	07	09	05	23	21	13	01	39
	RHSG	64	41	22	--	02	11	-07	06	02	09	-12	-07	27
	UNB	21	23	45	--	10	01	22	25	34	50	02	11	70
	UNG	27	-08	31	--	54	22	-01	09	25	42	-08	30	22
	RPB	25	25	34	19	27	05	11	18	35	27	-04	19	32
	RPG	22	-33	08	--	22	08	45	46	27	13	-14	24	58
Year 4 School Perception Item 1	UHSB	62	04	00	-06	-05	05	-08	07	10	13	07	04	16
	UHSG	56	-07	-18	-15	19	11	15	15	11	18	20	-04	24
	RHSB	71	20	-02	--	10	24	16	31	31	38	-09	07	41
	RHSG	62	09	09	--	19	14	11	20	15	17	08	-11	14
	UNB	20	08	--	--	39	57	-14	--	-44	-04	06	-19	-07
	UNG	25	01	04	--	-09	02	-03	-06	-06	-11	02	31	03
	RPB	24	25	16	24	17	14	23	23	36	28	37	62	40
	RPG	21	25	-13	--	32	19	05	19	-05	00	05	-07	53
Year 6 School Perception Item 1	UHSB	56	05	16	05	-06	14	29	20	37	32	-10	19	15
	UNSG	55	11	07	-16	-05	-09	00	-10	41	26	-11	18	13
	RHSB	58	-01	00	--	-02	09	-07	00	15	25	-12	31	02
	RHSG	58	15	00	--	-02	-12	25	17	42	31	22	05	-09
	UNB	20	30	--	--	-06	03	14	--	42	19	09	51	36
	UNG	24	03	-11	--	29	20	-16	14	30	42	06	10	19
	RPB	22	-09	18	03	-03	12	-01	-16	21	20	-28	-05	-03
	RPG	22	13	-26	--	-16	-35	-05	-05	24	22	01	13	18

Note. Decimal points omitted. Underlined entries significant beyond -05 level, two-tailed.

Characteristics of the Cognitive-Perceptual Measures

The cognitive-perceptual measures generally had high internal consistencies and moderately high stability over time; however, predictions from the first-grade Reading and Math scores were poor for urban low-SES boys. SES differences in performance were particularly evident on the academic achievement measures, and apparently increased with time in school. In all samples, girls obtained higher Reading scores in first and third grade, but, although in the same direction, no significant sex differences were obtained for the Math score; sex differences also were not evidenced for the Raven.

Within the Head Start samples, children from the combined urban sites consistently got higher scores on the cognitive-perceptual measures than children from Lee County (see Table B6). This difference was particularly large for the Year 2 PSI scores (over one standard deviation), when only the urban children had attended Head Start, and was less than half a standard deviation on the Year 6 measures. Further analysis of the difference (e.g., its relationship to specific Head Start program, age of entry into school, and the child's early grade school experiences) is beyond the scope of this report but is a prime area for future research.

Preschool Inventory: Means, standard deviations, and correlations for the PSI (and all the other cognitive-perceptual measures) are presented in Table B6. With the possible exception of the rural "Other Preschool" sample, no floor or ceiling effects were encountered, and the scores approximated normal distributions. Although sex differences in the urban low-SES and rural middle-SES samples were not significant for either Year 1 or Year 2, there were significant sex differences in the rural Head Start sample. Thus,

Table B6

Means, Standard Deviations, and Correlations Among Cognitive-Perceptual Measures

		Min. n	M	SD	Yr.1 PSI	Yr.2 PSI	Yr.3 PSI	Yr.3 Metro.	Yr.4 Read.	Yr.6 Read.	Yr.4 Math	Yr.6 Math	Yr.4 Raven
Year 1 PSI	UHSB	76	22.68	8.51									
	UHSG	64	25.17	11.52									
	RHSB	76	21.66	9.08									
	RHSG	67	25.01	9.32									
	UNB	26	23.88	8.75									
	UNG	32	26.47	8.64									
	RPB	36	39.92	9.87									
	RPG	28	41.29	7.89									
Year 2 PSI	UHSB	67	38.01	8.89	38								
	UHSG	60	40.94	9.49	68								
	RHSB	71	26.71	9.98	66								
	RHSG	63	30.45	8.86	59								
	UNB	22	36.64	9.09	70								
	UNG	27	40.33	8.53	49								
	RPB	35	50.03	8.02	83								
	RPG	27	50.28	9.47	72								
Year 3 PSI	RHSB	74	46.29	6.81	66	77							
	RHSG	65	47.27	6.08	47	73							
	RPB	34	56.08	4.97	59	54							
	RPG	27	57.74	4.82	61	74							
Year 3 Metro. Readiness	UHSB	46	48.89	14.33	11	25							
	UHSG	46	55.11	17.15	55	74							
	RHSB	69	40.67	14.16	37	53	56						
	RHSG	64	43.57	13.23	26	52	46						
	UNB	17	47.41	15.69	--	--	--						
	UNG	22	50.68	13.95	--	--	--						
Year 4 Coops. Reading	UHSB	35	21.50	9.86	08	16	--	-08					
	UHSG	33	25.86	11.43	38	25	--	36					
	RHSB	62	18.03	4.32	25	28	19	29					
	RHSG	61	19.65	5.23	25	36	31	21					
	UNB	20	19.15	3.83	--	--	--	--					
	UNG	20	21.33	8.79	25	--	--	--					
	RPB	28	31.61	10.55	60	63	59	--					
	RPG	26	35.48	9.73	66	65	57	--					
Year 6 Coops. Reading	UHSB	51	24.65	7.93	15	29	--	47	-12				
	UHSG	41	29.97	8.43	58	53	--	67	47				
	RHSB	74	23.11	8.10	44	48	37	31	44				
	RHSG	62	26.34	8.58	31	42	42	45	35				
	UNB	23	26.32	7.53	56	--	--	--	--				
	UNG	21	30.69	6.54	39	32	--	50	09				
	RPB	33	37.22	7.48	43	59	34	--	69				
	RPG	27	42.06	5.27	57	75	60	--	69				
Year 4 Coops. Math	UHSB	50	30.82	9.54	02	22	--	12	73	05			
	UHSG	39	32.82	10.10	38	34	--	50	81	41			
	RHSB	68	28.47	7.34	23	26	22	50	53	48			
	RHSG	58	30.95	6.76	33	63	63	52	24	54			
	UNB	20	32.45	4.25	--	--	--	--	--	--			
	UNG	22	33.88	8.70	29	--	--	--	--	28			
	RPB	33	41.47	6.95	64	63	62	--	65	44			
	RPG	27	42.32	7.04	51	77	61	--	75	68			
Year 6 Coops. Math	UHSB	55	28.47	8.07	-07	08	--	45	01	56	19		
	UHSG	41	30.46	9.19	49	39	--	48	34	67	42		
	RHSB	74	27.62	8.60	43	49	45	44	41	67	60		
	RHSG	62	28.55	7.72	26	47	45	40	44	66	46		
	UNB	20	30.61	6.20	17	36	--	--	31	36	18		
	UNG	20	32.42	6.96	35	35	--	53	53	32	30		
	RPB	33	45.24	9.28	54	70	40	--	69	74	56		
	RPG	28	46.46	8.51	31	65	63	--	54	56	61		
Year 4 Raven	UHSB	53	15.41	3.26	04	24	--	24	-28	40	05	25	
	UHSG	43	15.42	3.70	31	37	--	49	-11	43	06	39	
	RHSB	74	14.33	3.29	35	44	39	37	11	36	39	42	
	RHSG	63	14.25	3.17	16	27	22	20	11	22	24	38	
	UNB	22	15.68	3.77	24	--	--	--	--	28	--	43	
	UNG	20	15.64	3.01	00	00	--	18	--	41	03	03	
	RPB	33	20.32	5.65	38	54	49	--	62	36	66	45	
	RPG	27	19.74	3.92	36	59	59	--	41	48	58	62	
Year 6 Raven	UHSB	54	20.20	4.31	17	14	--	32	-22	34	12	33	50
	UHSG	43	20.83	5.32	50	57	--	53	11	57	30	56	59
	RHSB	71	18.26	4.31	29	33	27	32	44	51	35	46	37
	RHSG	63	17.28	3.95	08	32	32	24	28	37	34	50	56
	UNB	20	20.59	3.87	01	13	--	--	32	01	30	29	44
	UNG	20	19.88	4.40	14	07	--	43	15	26	25	10	35
	RPB	33	24.80	4.59	49	49	57	--	71	41	70	61	66
	RPG	28	26.34	5.21	58	71	65	--	60	61	63	78	64

Note. Decimal points omitted. Underlined entries significant beyond the .05 level, two-tailed.

in Years 1 and 2 girls in the rural Head Start sample did better than boys (t = 2.17, df = 141, $p < .05$, and t = 2.31, df = 132, $p < .05$). However, in the Head Start year in the rural site this sex difference was no longer evidenced. This apparently represents a temporary Head Start effect, since girls were again equal or superior on the later cognitive-perceptual measures. Consistent with previous findings, significant SES differences were evident in all three years. Stability coefficients were generally high as were coefficient alpha estimates of reliability. Thus, as has been found previously (e.g., Walker, et al., 1973), the P-I is a highly reliable preschool achievement test.

Cooperative Primary Tests--Reading. While no ceiling effects were encountered, floor effects were observed in first grade (Year 4). With a 50-item three-choice test, the mean score of a group of children making strictly random guesses would be 16.7. As can be seen in Table B6, a number of the means are close to this chance level. The reduced standard deviations in the two lowest scoring groups (black/low-SES urban and rural boys) provide additional evidence of the floor effects. Although none of the sex differences in Year 4 (all favoring girls) were significant, in Year 6 girls obtained significantly higher scores than boys in all samples.

In Year 4, alpha coefficients in the urban samples were high (.89 and .92 for boys and girls, respectively), but in the rural Head Start sample they were only .37 for boys and .62 for girls. For Year 6 Reading scores, however, alphas were over .80 in all subgroups. Except for the white/middle-SES sample, stability coefficients were low. Indeed, for black boys in the urban Head Start sample the correlation was negative (-.12). Means should not be compared across years since the items were different

in each year. However, comparison with the mean for the national standardization sample (24.5 [SD = 9.1] for first grade and 34.5 [SD = 8.9] for third grade, ETS, 1967) provides evidence of the familiar "fan spread" phenomenon with children in the black/low-SES groups falling further behind as they get older.

Cooperative Primary Tests--Math. The Year 4 scores did not have the serious floor problem that the Reading scores had. The lowest mean (28.5 for rural Head Start boys) was well above the chance score of 18 on this 55-item test (60 items in Year 6). There were no significant sex differences in either year. Alpha reliabilities were generally in the .80's. Stability coefficients were moderately high except for boys in the urban samples where it was only .19 and .18 for the Head Start and "No Preschool" groups, respectively. The mean of the national standardization sample was 35.6 (SD = 8.2) for the first grade scores and 39.4 (SD = 9.0) for the third grade scores. Thus, in math, too, there was evidence of black/low-SES children falling further behind.

Raven Colored Progressive Matrices. Scores approximated a normal distribution, and no floor or ceiling effects were encountered. There were no significant sex differences in either year. Consistent with previous findings, significant SES differences were obtained in both years. Alpha reliabilities across subgroups were in the .70's to low .80's. Stability coefficients were all significant and fairly substantial (.35 to .66).

Relationship Among Cognitive-Perceptual Measures

While not one of the measures used in the predictive analyses in the main body of this report, means, standard deviations, and correlations for

the group-administered Metropolitan Readiness Test are also included in Table B6 for comparison purposes. PSI scores from Years 1, 2, and 3 were generally predictive of subsequent achievement in basic school skills, with higher correlations to achievement in Year 6 than in Year 4. However, Year 1 and 2 PSI scores were poor predictors for boys in the urban Head Start sample; correlations of Year 1 PSI with the Year 6 cognitive-perceptual scores ranged from -.07 to .15, while correlations from the Year 2 score ranged from .08 to .29. Thus the best correlation for this sample of urban boys accounted for less than 9% of the variance in the Year 6 scores. The intercorrelations of Year 6 Reading, Math, and Raven scores were generally significant. Both within and across years the cognitive-perceptual measures were most highly correlated within the white/middle-SES groups.

Although Year 3 Metropolitan Readiness Test scores were predictive of third-grade achievement for urban boys, Year 4 achievement scores failed to predict subsequent achievement. A similar lapse in prediction in low-income, urban boys was noted by Pusser and McCandless (1974). In a longitudinal sample of low-SES children from Atlanta they noted the failure of preschool verbal facility scores (teacher ratings and Peabody Picture Vocabulary Test scores) to predict first-grade achievement (Metropolitan Achievement Test) for boys, with a recovery of prediction for second-grade Metropolitan Achievement Test scores. They attributed this lapse in prediction to the "public school shock" that agressive young boys, especially young black boys, encounter when they begin traditional passive, obedience-oriented first grade.

Combining over all subgroups, Year 2 PSI scores related about .60 with third-grade Reading and Math scores. These values are comparable to the

predictive validities of early cognitive-perceptual measures obtained in other longitudinal studies. Kohn and Rosman (1974) reported correlations of .61 from scores obtained by kindergarten boys on the Stanford-Binet to Reading and Math achievement scores in second grade, while Pusser and McCandless (1974) obtained correlations between their verbal facility factor and second-grade achievement of .36 and .55 for boys and girls, respectively. As a further check on validity of the PSI, correlations to Year 6 achievement from Year 2 scores on the Peabody Picture Vocabulary Test (another preschool cognitive measure that has been extensively used in prediction studies) were found to be nearly identical to predictions from the PSI.

For the rural samples, Year 2 PSI scores correlated with the achievement measures at least as well as the PSI scores obtained one year later. PSI performance was significantly related to Year 4 Raven scores in all subgroups except for the small group of urban black girls who did not attend preschool, but for rural Head Start girls and urban boys the correlations were only in the .20's. PSI scores failed to predict significantly Year 6 Raven scores for both the urban "No Preschool" sample and urban Head Start boys. Correlations obtained for PSI scores with Year 4 and Year 6 Reading and Math achievement scores and Raven scores were consistently higher for the white/middle-SES children, reflecting the greater validity of these measures for estimating the ability of middle-SES children to acquire basic academic skills. Since the regression slopes were not parallel, predictions that attempted to use the regression equation from the white/middle-SES children to predict achievement scores for black/lower-SES children (or vice-versa), or that used a common regression equation, would lead to

less than optimal and possibly inaccurate predictions.

Year 4 Reading and Math scores were significantly correlated for all subgroups. Considering the other characteristics of the Year 4 Reading scores in the urban sample (e.g., the low correlations of the Reading score with both the prior PSI and the subsequent Year 6 Reading score), the intercorrelation of the Year 4 Reading and Math scores is suspiciously high, and may be caused by some systematic response bias that operates in some children on both scores (e.g., a tendency to guess when uncertain). The Year 4 Reading score also was not significantly correlated with either the Year 4 or Year 6 Raven scores for both boys and girls in the urban samples. For rural Head Start children, Year 4 Reading scores were correlated with Raven scores in Year 6 but not in Year 4. Further analysis of the Reading score is needed, although for low-SES black urban boys it seems of very dubious value. The Year 6 Reading score was substantially correlated with the Year 6 Math score in all subgroups. With the exception of the small urban "No Preschool" sample, the Year 6 Math score was significantly correlated with Year 6 Raven scores. In both Year 4 and Year 6 Raven performance for the rural samples tended to have higher concurrent correlations with Math scores than with Reading scores; this was not true for the urban samples.

Appendix C

List of Abbreviations

List of Measure Abbreviations

In all cases the number preceding the letter code refers to the year of the Longitudinal Study in which the measure was administered.

C (or CSEI)	-	Coopersmith Self-Esteem Inventory
CBI	-	Schaefer Classroom Behavior Inventory
G	-	Gumpgookies
M	-	Self-Concept Referents Test - Mother Referent: Self-Esteem score
Math	-	Cooperative Primary Mathematics Test
Metro.	-	Metropolitan Readiness Test
PSI	-	Preschool Inventory
Raven (or RPM)	-	Raven Colored Progressive Matrices
Read.	-	Cooperative Primary Reading Test
S	-	Brown IDS Self-Concept Referents Test - Self-Referent: Self-Esteem score
SP1	-	School Perception Interview - Item 1
SP21	-	School Perception Interview - Item 21
S-TO	-	Schaefer Classroom Behavior Inventory: Task Orientation score
T	-	Brown IDS Self-Concept Referents Test - Teacher Referent: Self-Esteem score

List of Subgroup Abbreviations

UHSB	-	Urban Head Start boys
UHSG	-	Urban Head Start girls
RHSB	-	Rural Head Start boys
RHSG	-	Rural Head Start girls
UNB	-	Urban No Preschool boys
UNG	-	Urban No Preschool girls
RPB	-	Rural Other Preschool boys
RBG	-	Rural Other Preschool girls