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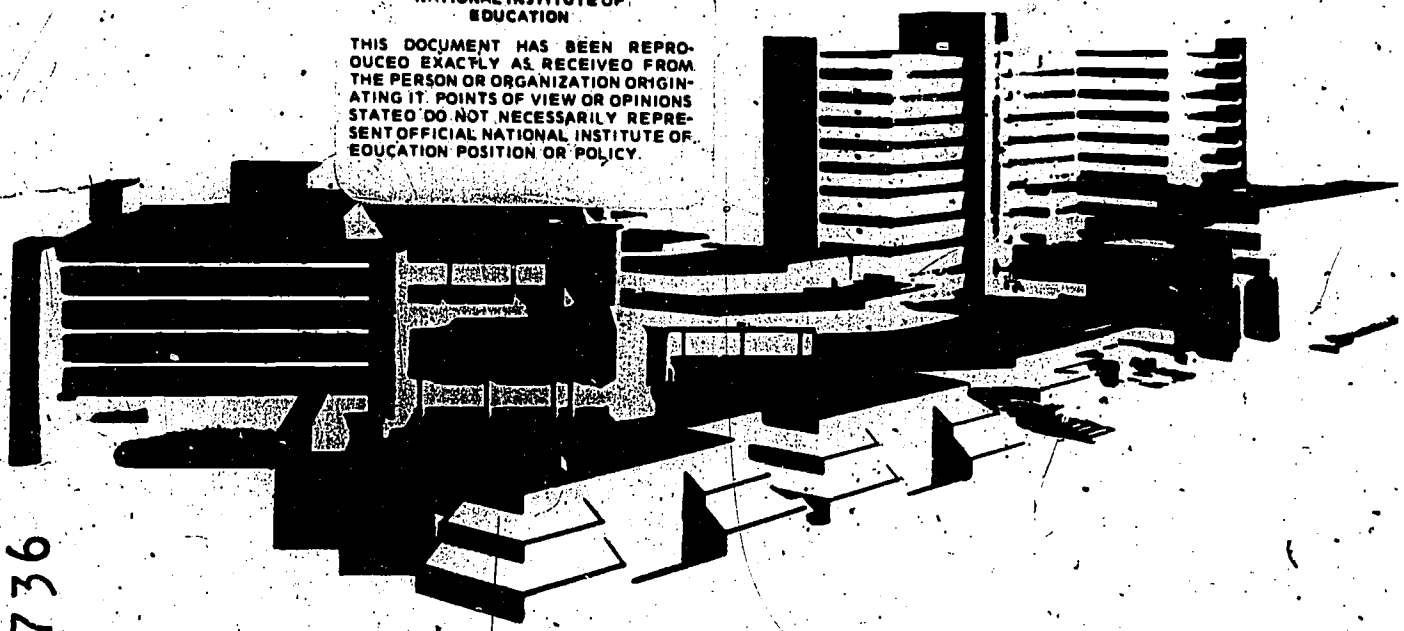
ABSTRACT

This final program evaluation report assessing the University of Western Ontario Preschool Project examined the cognitive and social development of 60 high and low income preschool children to determine whether the program had had a compensatory educational effect on economically disadvantaged children. The data analysis focused on: (1) the children's social competence; (2) their motivational characteristics and cognitive styles; and (3) their intellectual and cognitive abilities. Results showed that the UWO program had been reasonably successful in achieving social development progress and IQ gains with both high and low income children, and that, for the low income children, the program had special compensatory value in the intellectual and cognitive areas. (SE)



THE U. W. O. PRESCHOOL PROJECT

FINAL REPORT: PART I

Program Evaluation: The Immediate Impact

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Preface

This submission is part of the final report on the University of Western Ontario (U.W.O.) Preschool Project. The project was initiated in the academic year 1973-74 when the Department of Psychology opened its new laboratory preschool. Its general aims were to obtain a better understanding of the characteristics and abilities of Canadian children from economically disadvantaged homes, and to test the "irreversibility" hypothesis, still held by some, that the adaptive abilities of young children can not be modified effectively after the age of three years. It became, however, in part, a development project, in that the data obtained were used to assist in the design and evaluation of the educational program. Also, because suitable measures for assessing certain types of abilities were not available, a significant amount of time was invested in developing such measures. Finally, some experimental work was also done to assess the immediate impact of specific program variables.

In the four academic years which ended in the spring of 1977 more than 100 children have been involved in the project, 63 from families with low-incomes and the rest from families with medium to high incomes. Of the low-income children 39 were enrolled in the laboratory preschool and 24 in local day nurseries, but all of the high-income children were in the preschool. Most of the subjects were selected at the age of approximately three years, in the hope that they could be studied over a two-year period. However, attrition in this sample was high, especially at the end of the first year, and although 60 preschool and 9 day nursery subjects completed one academic year only 50 completed, as well, a second year.

In addition to the subjects who were enrolled as three-year-olds, there were some others who were enrolled as four-year-olds and attended the program for only one year. These older subjects were included to assess the effects of early versus late preschool entrance on performance in both the preschool and the primary grades. The findings obtained with this particular group of subjects will not, however, be discussed here.

In the present report, the development of the three cohorts of children who entered the program at the age of approximately three years (in 1973,1974,1975, respectively) and stayed in it for either one or two full academic years is described. The focus is on program evaluation. The program was changed over time in an attempt to meet the apparent needs of the low-income group. The effects of these changes are examined as well as the over-all compensatory impact of the program.

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The most controversial issue in the field of early education today continues to be about the amount of "structure" which is appropriate in an early education program. The word "structure", used in this context, is not easy to define. Essentially, it refers to the extent to which pupils are instructed, or the extent to which teacher pre-planning of the timetable, space, equipment, curriculum content and the like, directs the kinds of activities in which the children engage. For example, in a traditional Montessori school the teaching materials are structured. In a DISTAR program (Bereiter & Engelmann, 1966) the academic content to be taught and the teaching methods are structured (specified exactly). In Weikart's cognitively-oriented curriculum (Weikart, 1971), the curriculum is structured, (i.e. the cognitive processes to be activated are pin-pointed). Programs with mainly personal-social goals can also vary in structure depending, for example, on the number of teacher-child encounters that are pre-planned for whatever purpose.

The heat generated by debates on this issue greatly increased during the late 1960's when a number of Head Start researchers reported findings which seemed to indicate that directive, highly structured preschool programs were more effective in inducing cognitive gains, especially in disadvantaged children, than were more informal ones. Most preschool teachers read reports of such findings with disbelief and even horror, believing that direct instruction of the type offered could, in fact, be harmful to such young children. After 50 years of child study and experience with young

children, most early educators had become convinced that preschoolers should not be taught, but educated, given intellectual content of the sort that would encourage inquiry, debate and problem solving, but not told what was "right", that they learned best by actively operating on their world and discovering its laws rather than by precept, and that they should be playing not working. However, by far the greatest amount of information about how a nursery school should be run had been acquired through studies of middle-class children. Perhaps lower-class children were different. If they received little cognitive stimulation from adults at home, perhaps they did need more adult-guided activities in school. This issue was foremost in the minds of the group at U.W.O. when they sat down to decide on how the program should be run.

There was some evidence that less seriously disadvantaged children responded well to informal programs (Bissell, 1973). There was also reason to believe that Canadian, anglophone children from families with low incomes, living in a medium-sized city such as London, Ontario were likely to be less disadvantaged than the children usually included in American Head Start studies (Wright, 1973). Therefore, it was decided that in the first year the program would be informal, as described below, and some baseline data on the response of the children to it would be obtained. Children from families with both low and high incomes were, therefore, enrolled in the preschool, and their initial performance and progress over time were compared.

The usual procedure for assessing the effectiveness of a compensatory program is to compare the program's products with the products of a contrasting program, or with children who have had no preschool experience.

Initially, this type of evaluation was included in the present project. That is, the progress of the low-income subjects in the preschool was compared with that of a group of low-income subjects in another setting (day nurseries). This approach was, however, abandoned, in part because attrition in the day nursery groups made it impractical, but also because it presented so many methodological problems. It became clear that even if differences in the products of the preschool and day nurseries were found, the causes of these differences could not be determined. Many variables differentiated the preschool from the nurseries in which the control subjects were found and some of these, such as teaching styles, were too subtle to be specified with any degree of precision. It was decided therefore, that if the effects of specific program variables were to be successfully assessed, they would have to be manipulated systematically within the laboratory preschool program, and internal (rather than external) control subjects employed. Automatic control of a number of important environmental variables could be achieved in this way. Accordingly, changes in the program, as described below, were instituted in the second and third years of the project and the effects of these changes were assessed by comparing the gains made by the children who were enrolled in the first year, with those made by the children who were enrolled in subsequent years.

The compensatory impact of the program on the low-income children was assessed by comparing their progress over time with that of the high-income subjects. However, from both a theoretical and empirical point of view it was not easy to predict what type of results would justify the conclusion

that the program had, in fact, been effective for the low-income children. All aspects of development depend on some combination of genetic and environmental factors. This means that different children will respond differently to any educational experience to the extent that their genetic make-up and past experience differ. If the high-income children had higher IQs than the low-income children, and if IQ can be interpreted as a measure of the capacity to learn, then it would be expected that the performance gains made by them, given equal opportunities for learning in the preschool, would greatly exceed those of the low-income group. In other words, any initial differences between the high- and the low-income groups would be expected to increase. Also, if the high-income children received more stimulation at home than did the low-income children, they might be better equipped to respond to and gain from the experiences in the preschool. On the other hand this stimulation might have brought them up to a performance level which was commensurate with their genetic potential and, if so, the effects of the educational program might, in fact, be minimal. The empirical evidence available for making predictions of this sort is sparce, but whether or not a preschool program has a major impact on children seems to depend on whether it offers opportunities for learning which are not provided in the children's homes. Montessori preschool education has been found to have a major impact on the development of the disadvantaged, but not the advantaged child (Miezitis, 1971), presumably because Montessori teachers and middle-class parents tend to teach essentially the same things. On the other hand programs

such as DISTAR have produced greater gains in advantaged than disadvantaged children, presumably because specific new skills, not emphasized in either middle- or lower-class homes, are taught.

It was expected that the U.W.O. program would have a greater over-all impact on the children from the low- than the high-income families. It seemed likely, however, that the high-income children would have abilities, such as better language skills, which would help them benefit more immediately from the program than the low-income children. It also seemed likely that unless the program was particularly effective in supporting the development of the low-income children, the differences between them and the high-income children would increase (rather than remain constant or decrease) over time especially when this time was as long as two years. If the difference between the groups did not increase and, especially if the differences decreased, the conclusion that the program had had compensatory effects appeared to be justified.

Program changes by year.

A detailed description of the preschool and the development of its educational program in the first three years is provided elsewhere (Wright, 1976). The following summarizes the major changes in the program over time and the reasons for them.

The theoretical position on which the program was based was cognitive-developmental. It was, therefore, an active-discovery, play-oriented program and the activities in which the children engaged were self-selected. The program was, however, semi-structured, in the sense that there was a timetable or a regular sequential pattern to the array of program activities offered to the children each day.

The first year was the "start-up" year for the preschool. Everything was "new" including all of the staff and children. Hence, this year was different in many respects from any subsequent year. Although extensive pre-planning had been done, the initial organization of space and equipment was not functionally adequate and re-arrangements had to be made. A suitable design for the playground was not achieved until late in the spring. The curriculum emphases were also different in the first than in any subsequent years. No individual or small group, teacher-guided activities aimed at the development of specific cognitive skills were offered. The focus was mainly on achieving the personal and social goals of the program, the development of independence, self-management skills, representational abilities and effective problem solving styles. A highly enriched and novel environment containing much equipment was offered from the start. Also, from the beginning of the year "Surprise" dramatic play centres, such as a medical centre or grocery store, were introduced at regular intervals to stimulate socio-dramatic play.

Summative evaluations of the program at the end of the first year suggested that it had been most effective in increasing the social competence of the children, but less effective than desired, at least with the children from low-income families, in reducing impulsivity and inducing cognitive gains especially in conceptual areas (Wright, 1974). It was concluded that the failure to reduce impulsivity might have been due to the amount of variety and novelty in the environment and that this should be reduced, at least during the beginning of the school year. It was also decided that more emphasis should be place on achieving the cognitive goals of the program and that teacher-guided, small group

activities should be introduced for this purpose.

Accordingly, in the second year the amount and variety of equipment offered during the first six weeks was reduced. No novel dramatic play centres were introduced during this period and when they were finally offered, they were preceeded by field trips to appropriate places (eg. a clinic) discussion sessions with appropriate persons (eg. a doctor) and teacher-guided group activities in which the children made props for the centres. The children then participated in the actual setting-up of the centres.

During this second year the teachers also began to study the literature on the development of cognitive abilities and concepts, such as number, seriation, classification, and space, in order to develop assessment guides and plans for small group teacher guided activities which might foster the acquisition of number and other types of concepts. Early in the second term a pilot study was conducted to assess the effectiveness of the strategies that they had developed for inducing an understanding of number. Two groups of eight children whose scores on "number" were low were used as subjects. One group was given number stimulation and the other group language stimulation in small group sessions every day for two weeks. Their number and language performance was then re-assessed. After the testing week the same subjects were given another series of teacher-guided sessions with the original number group receiving language stimulation and the original language group receiving number stimulation. The results of this study suggested that the number stimulation had produced at least modest gains in performance on number and that both number and language stimulation sessions had had a positive effect on language performance. Hence, it was decided that small group work was likely to be productive in increasing

the cognitive competence of the children and should be incorporated into the program in a systematic way.

The summative evaluations of the program at the end of the second year suggested that it had been more effective than the program in Year 1 in reducing impulsivity and inducing cognitive gains, especially in number in the low-income group (and the achievements of the high-income subjects were about the same in both years). There was some indication that it had been less effective in increasing social competence (Wright, 1976a), but because of the cognitive benefits which the low-income children seemed to be deriving, the program was run in essentially the same way in Year 3 as it had been in Year 2, except that plans for teacher-guided activities were more highly organized. A new method for assigning pupils to teachers for small group and individual teacher-guided activities was introduced. Each teacher was assigned seven children in each class for specific blocks of time during which she was to attempt to achieve with them cognitive goals in specified areas. By this time the Assessment guides and a set of plans for small group work had been prepared. The teachers were, however, responsible for planning activities suitable for each individual child, and for deciding whether to work with their special charges individually or in small groups.

During the third year an analysis of the play behavior of the children in the preschool, conducted by an investigator who was not directly associated with the preschool (Wright & Pederson, 1976), indicated that the program was generating more task-oriented than social behaviors. Using Parten's (1932) criteria he found that the children were engaged in solitary, parallel or non-play activities (i.e. doing something with a teacher) about 77% of the time

and engaged in associative and cooperative play only 23% of the time. Using Smilansky's (1968) criteria he found that 67% of the behavior observed was constructive, 23.7% dramatic, 9% functional and 0.3% games.

In the fourth year, the program was not changed again, and during this year the attention of the teachers was focused more and more on the development of cognitive skills. They wrote papers summarizing the literature they had read, developed more plans for individual and small group activities which they thought might increase the children's cognitive abilities, and they tried to describe in writing the teaching strategies which they had employed.

In summary then, as the program developed, there was a gradual shift toward more structuring of the curriculum experiences which the children were offered; more emphasis was placed on the development of specific types of cognitive concepts such as number, classification, seriation and spatial relations; there was more teacher direction of the children's activities; and there was less encouragement of socio-dramatic play activities. Otherwise, the basic structure, organization and goals of the program did not change.

Other uncontrollable variables

Staff changes. These were few but there were some. The Director and the Teacher-Supervisor of the program remained constant during the four years. There were three other teachers. One of these resigned at the end of the first year, but her replacement continued during the subsequent three years. The other two teachers taught all four years, but both did so only half-time in Year 4 and a new full-time staff member was added.

Teacher/child ratio. Each year there were four full-time (or equivalent) teachers, but the number of children was increased from 25 per class in the first year to 27 in the second year and 28 in the third and fourth years. The number of children per teacher increased, therefore, from 1:6.25 (1973-74) to 1:6.75 (1974-75) to 1:7 (1975-76 and 1976-77).

Ratio of low-/high-income children. The number of low-income children in each of the programs was increased from five in 1973-74 to seven (am program) and eight (pm program) in 1974-75, and 10 in 1975-76 and 1976-77) and the number of high-income children decreased. Thus the ratio of low- to high-income children changed from 1 to 4 in Year 1 to 1 to 2.85 (am) to 1 to 2.37 (pm) in Year 2 and 1 to 1.8 in Years 3 and 4.

Regularity of attendance. The high-income subjects attended more regularly than the low-income subjects (for all three years combined, 93% as compared with 88% of the time). There were no significant cohort differences in absenteeism although the trend was toward greater absenteeism for the low-income subjects in the second and third, than in the first cohort. Also, six children in the low-income sample who required speech therapy were in cohorts 2 (n=1) and 3 (n=5) and their diagnostic and treatment sessions took them out of the preschool for an hour or more at least two days a week during their second preschool year.

Method

Subjects

The subjects were 60 children who were enrolled in the preschool as three-year-olds and remained in the program for at least one, or two full academic years. They represented three subject cohorts who started school in

three consecutive years (1973, 1974 and 1975). A description of them by cohort, sex, chronological age and socio-economic status is presented in Table 1.

Insert Table 1 about here

The cohorts varied in size and in the proportion of boys to girls and of low- to high-income children in each. Their constitution also changed from the first to the second preschool year. These variations were caused in large part by attrition, but also because of difficulty in finding low-income subjects who met the criteria in any given year. However, in the total sample (all cohorts combined), the two sexes were about equally represented, and when they were in their second preschool year the size of the two income groups was about the same.

The socio-economic differences between the two income groups were large. There was no overlap in either educational or occupational achievement and their SES indices fell at opposite, and in most instances at the extreme ends of the Hollingshead (1967) SES scale. The number of single parent and intact families and the education and occupations of the parents in each group are show in Table 2.

Insert Table 2 about here

Table 1

Description of the subjects by Cohort, Sex, Age and Socio-Economic Status

	First Year in Preschool					Second Year in Preschool				
	n	Male	Female	CA Mean (SD)	SES Index Mean (SD)	n	Male	Female	CA Mean (SD)	SES Index Mean (SD)
ort 1										
Low-income	9	3	6	3.18(.281)	32.67(6.86)	8	2	6	4.13(.252)	30.50(2.33)
High-income	8	3	5	3.07(.265)	68.0 (10.33)	6	2	4	4.11(.272)	68.33(10.80)
All subjects	17	6	11	3.13(.270)	49.29(20.02)	14	4	10	4.12(.250)	46.71(20.62)
ort 2										
Low-income	4	3	1	3.29(.293)	30.56(3.06)	4	3	1	4.29(.293)	30.56(3.06)
High-income	13	7	6	3.24(.264)	72.41(8.03)	11	6	5	4.27(.229)	71.81(8.65)
All subjects	17	10	7	3.25(.265)	62.56(19.61)	15	9	6	4.26(.246)	60.81(20.29)
ort 3										
Low-income	12	6	6	3.33(.223)	30.48(5.03)	12	6	6	4.33(.223)	30.48(5.03)
High-income	14	7	7	3.16(.241)	73.08(6.91)	9	4	5	4.11(.253)	72.52(8.32)
All subjects	26	13	13	3.24(.243)	53.42(22.48)	21	10	11	4.23(.255)	48.50(22.28)
Cohorts										
Low-income	25	12	13	3.27(.255)	31.28(5.37)	24	11	13	4.22(.249)	30.50(3.80)
High-income	35	17	18	3.17(.255)	71.77(8.11)	26	12	14	4.18(.247)	71.25(9.03)
All subjects	60	29	31	3.21(.257)	54.84(20.97)	50	23	27	4.21(.251)	51.69(21.22)

S Index (Blishen, 1967)

Table 2

Parents of the subjects: Number in home, education and occupation*

	Low-income (n=25)	High-income (n=35)
Number Of Parents In Home		
One	12	2
Two	12	33
Education Level Attained		
Grade 8 or less	10	
Some secondary	11	
Grade 12	3	
Secondary and Technical		3
B.A. degree		2
Advanced training		30
Occupation When Employed		
Unskilled Labour (Factory)	8	
Kitchen Worker (Restaurant)	4	
Never employed outside home	3	
Truck Driver	2	
Painter	2	
Repairman	1	
Custodian	1	
Bookeeper	1	
Bell Telephone Operator	1	
Hairdresser	1	
Warehouse Clerk	1	
University Professor		13
Physician		6
Secondary School Teacher or Administrator		4
Lawyer		3
Graduate Student		3
Engineer		2
Contractor (Builder)		2
Professional Musician		1
Comptroller		1

*Education and occupations are of fathers in intact families and of mothers in single parent families

Half of the families in the low-income sample were single parent families, but all but two of the families in the high-income group were intact. The reliability of the information on the education of the parents in the low-income sample is uncertain because it was obtained through interviews with the parents themselves. However, a third of the wage-earners in this group reported no training beyond the elementary level and those who had completed any secondary work beyond grade 9 said they had done so in a non-academic program in a technical or "special" school. In contrast, all of the salary-earners in the high-income families had some kind of post secondary school training and all but three had university degrees, most of them at advanced levels or in a highly specialized profession.

The employment histories of the low-income parents were irregular. All of them had worked at a variety of different types of jobs for varying lengths of time. The occupations listed in Table 2 are the ones in which they had engaged for the longest single period of time, although this was sometimes for only a few weeks. During the project none of the 12 single mothers and only half of the 12 fathers were regularly employed. In contrast, all of the earners in the high-income group (except the graduate students) were regularly employed in a specific occupation, the majority as academics, physicians, lawyers and secondary school teachers and administrators.

The actual incomes of the families are not reported (first), because the fee-paying parents were not asked to reveal them and (second), because the incomes of the low-income families fluctuated so much from time to time. In the low-income group the 12 single mothers were receiving the Mother's Allowance.

One father was retired and living on a Department of Veteran's Affairs pension. Six others worked fairly regularly during the project, but all of these, with a single exception, had a history of unemployment, had been on welfare, were still in debt and were receiving some form of social assistance. The other five fathers worked intermittently and were on welfare.

Known family instability, which affected the children directly, occurred during the project in only one of the high-income families, but in several of the low-income families. In the low-income sample two subjects suffered parental abuse which resulted in court proceedings. Three others were made temporary wards of the Children's Aid and experienced an intermittent series of both institutional and foster home placements. Two others had mothers who were receiving psychiatric treatment, one of them because of her impulse to destroy the child. The families of these children also tended to be highly mobile. Three moved five to six times, five moved two to four times and nine moved at least once. The adults present in the home, at least in the single parent families, also tended to vary frequently.

There were four native (Indian) children in the low-income group, one in the first and three in the third cohort. The rest of the subjects in both income groups were white.

More unrecognized disabilities which required diagnosis and treatment outside the preschool were detected in the low- than in the high-income groups. Only two of the high-income children presented any special problems and these were articulatory. However, six of the low-income subjects had

articulatory difficulties and two others had auditory and respiratory problems which required surgery for their correction.*

Selection of the subjects. All subjects were selected without pre-testing, the low-income group from children who were recommended for the project by a variety of different agencies, the high-income group from among the children of the fee-paying parents. The selection criteria, in addition to socio-economic status were (a) that the child had had no previous group care experience and (b) was free of any known major sensory, mental or motor disability. The subjects in the two income groups were matched for age and sex.

Low-income families: cohort differences. When the low-income subjects for Cohort 3 were selected, changing circumstances made it necessary to modify both the recruitment procedures and the funding arrangements which had been employed with cohorts 1 and 2. These modifications and their immediate consequences are described below.

First, all of the subjects in cohorts 1 and 2 were recommended by a specific Family & Children's Services Agency with which close working relationships had been established. Before the project began this Agency appointed a coordinator to work with the principal investigator and agreed to provide any support for the families that might be required. Social workers from this Agency made the initial approach to the families, brought them to the school for their preliminary visits and accompanied them on their child's first day in school. They worked closely with the

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*Two other children were so severely handicapped that, although they were continued in the program for two years and treated successfully, they were excluded as subjects. One was deaf and the other seriously disturbed emotionally.

preschool staff and tried to implement any recommendations that were made for modifying the subjects' home conditions. All of the children in these two cohorts were funded through grants from a variety of sources, but each was known as a "scholarship" child. Their families were given to understand that their children had been specially selected for these scholarships and this appeared to induce in them considerable pride and interest in their children's progress. All but one of these families participated in the program activities provided for them frequently and with enthusiasm.

Only four of the 12 children in the third cohort were referred by this Agency. The other eight were recommended by public health nurses or, in one case, by a housing bureau. As a result the families of these eight children did not receive any special support or guidance other than what could be provided by the preschool. Furthermore, the funding arrangements for these children were different. In order to "stretch" the available funds and admit more children, all of the families in this cohort were asked to apply to the City for a subsidy. This required that they be interviewed at City Hall and take a Means Test. All of them qualified, at least initially, for the subsidy. However, this procedure did nothing to increase the parents' pride or interest in their children's progress and they did not participate in preschool activities as frequently or with the same enthusiasm as did the families in the first two cohorts.

The "subsidized" children in Cohort 3 also appeared to be, as a group, somewhat more socio-economically disadvantaged than were the "scholarship" children (cohorts 1 and 2). When judged on the Blishen (1967) SES scale, which

is based on occupational status, no significant cohort differences in SES status were found. However, when other factors such as education and employment history (e.g. continuous as opposed to irregular employment) were taken into account, the parents of the children in cohorts 1 and 2 appeared to be more competent than the parents of the children in Cohort 3. The education of the 12 wage-earners in the first two cohorts was grade 12 (n=3), grade 11 (n=2), grade 10 (n=2), grade 9 (n=1), grade 8 (n=4), but in Cohort 3 was grade 10 (n=4), grade 9 (n=2), grade 8 (n=4) and less than grade 8 (n=2). In the first two cohorts five of the six fathers and three of the six mothers were, or had been at some time, regularly employed, but in Cohort 3 only two of the six fathers and only two of the six single mothers had ever worked regularly.

Assessment Measures

The initial abilities of the children and changes in these abilities over time were assessed in three main areas: (a) social competence, (b) motivational characteristics and cognitive styles and (c) intellectual and cognitive abilities.

The measures of social competence were developed by the present investigator (Wright, 1977). They consisted of (1) the Peer Interaction Score (PSIS) which was a measure of the frequency with which the children interacted with their peers, (2) a Peer Interaction, Quality-Effectiveness Score (PI,Q-ES) which was a measure of the frequency with which they interacted with their peers in qualitatively superior and effective ways and (3) a score derived by calculating the ratio of the PI,Q-ES to the PSIS which measured the proportion of the child's peer interactions which were qualitatively

superior and effective. The PSIS was based on the frequency with which a child displayed 14 types of child-child interaction events included in five categories of behavior selected from the Manual for Assessing Social Abilities of One- to Six-Year-Old Children (White & Watts, 1973, pp 332-359). The categories were Leading/Following Peers, Expressing Affection/Hostility to Peers, Competing with Peers, Seeking the Attention of Peers and Using Peers as an Instrumental Resource. The PI,Q-ES was based on the frequency with which the child displayed four types of peer interaction events which were qualitatively superior (positive) and effective (successful) in achieving their social goals. These were Leading Peers, Seeking the Attention of Peers, Using Peers as an Instrumental Resource and Expressing Affection to Peers. The ratio of PI, Q-ES/PSIS scores were used to control for the general level of social activity. For example, a less active child might interact somewhat less frequently than others but when interactions occurred a high proportion of them might be superior in quality.

The measures of motivational characteristics and learning and cognitive styles were two Circus tests "Think it Through" (Problem Solving), "Make a Tree" (Creativity), The Kansas Reflection-Impulsivity Scale for Preschoolers (KRISP, J. Wright, 1971) and Teacher Ratings of Self-Direction, Mastery, Self-Management, Curiosity, Creativity and Imagination. The Teacher Rating scales were developed by the principal investigator (Wright, 1974). A set of operational definitions was provided for each dimension of behavior assessed, the teachers were carefully trained in the use of the measure and the reliability of their ratings, as measured by the correlations between the ratings assigned to the subjects by all teacher pairs, was consistently high. ($p < .01$).

The measures of intellectual and cognitive ability were the Stanford Binet Intelligence Scale, The Cooperative Preschool Inventory, 1970 edition and two Circus tests "Say and Tell" (Language) and "How Much and How Many" (Number).

Assessment Procedures

Each year assessments were made at two times (a) in the fall (October-November), at least one month after the subjects were enrolled in the preschool and (b) in the spring (May-June), seven months after the fall assessment. The observations of the children's social behaviors and the testing were done in alternate weeks so that no child was tested during the period when his social behavior was being assessed.

The data on the social behavior of the subjects were collected by four trained observers, two men and two women, who coded the behavior immediately and recorded it on a checklist. Each subject was observed for five 10-minute periods, on each of five consecutive days, at the same five specified times which were all different, by a minimum of three different observers. Four samples were taken during free play (two outdoors and two indoors) and one during a small group, teacher-guided activity (circle time). Hence, the scores were based on a 50-minute sample of each child's behavior. The observations were made in the playroom or playground, but care was taken, prior to data collection, to make the observers familiar and uninteresting to the children so that they were ignored.

Inter-observer reliability for these behavior measures was high. The overall agreement among all coder pairs, measured both before and during each assessment period, at two times in each of three years, ranged from

87.1 to 89.6 ith some pairs agreeing over 94% of the time (Wright,1974, 1975a, 1976a).

All of the tests were administered individually in a testing room in the preschool which was familiar to the children. Only one test was given to a child on any single day and each test was given to all of the subjects by the same tester. The tests were given in a randomized order except that the Binet and the Preschool Inventory were always given at least one week apart. All children were tested in the same order in the spring as in the fall except when absenteeism made this impossible.

The Teacher Ratings were done during each four-week assessment period. Each of four teachers rated one quarter of the subjects each week so that each child was rated every week, but by a different teacher. The rating scores were the means of the ratings assigned by the four teachers.

Results

Data Presentation and Analyses

First-year-in-preschool and second-year-in-preschool data were analyzed separately, because the number of subjects at each level was unequal. Some tests were not given in the first year of the project, therefore data for Cohort 1 on first-year-in-preschool performance on these tests were not available. A series of 3(Cohort 1,2,3) x 2(Income Group: high, low) x 2(Time: fall, spring) ANOVAs, or when appropriate 2(Cohort) x 2(Income Group) x 2(Time) ANOVAs were performed on the data.

Graphs showing changes in the performance of the groups over a two year period are based on data for only those subjects who actually did attend preschool for two consecutive years.

Under each major section of the results the findings are examined (a) for Cohort effects, to see if any one Cohort did better than the others, a finding which would suggest that the program offered that Cohort had been superior and (b) for Income Group or Income Group x Time interaction effects, to see if any socio-economic differences which were found were reduced over time, a finding which would suggest that the program had had a compensatory effect.

Social Competence

Mean Peer Social Interaction Scores (PSIS), Peer Interaction, Quality-Effectiveness Scores (PI,Q-ES) and ratio of PI,Q-ES/PSIS scores are shown by income group and cohort for the first year in preschool in Table 3 and for the second year in preschool in Table 4.

Insert Tables 3 & 4 about here

Changes in the mean PSIS and PI, Q-ES over time are shown graphically by Cohort for each income group in Figures 1 and 2. Changes in the mean PI,Q-ES over time of all subjects (all cohorts combined) in each income group are shown in Figure 3.

Insert Figures 1,2,3 about here

First year in preschool. The analysis of the PSIS yielded a significant main effect for Time, $F(1,54) = 26.77$, $p < .0001$ and a significant Cohort x Time interaction effect, $F(2,54) = 3.53$, $p < .04$. The scores of all cohorts increased over time but the

Table 3

Mean PSIS[1], PI,Q-ES[2] and ratio of PI,Q-ES/PSIS by Cohort, Income Group and Time for the first year in preschool.

Cohort	n	PSIS			PI, Q-ES			Ratio of PI,Q-ES/PSIS		
		Fall	Spring	Diff	Fall	Spring	Diff	Fall	Spring	Diff
Cohort 1 (in 1973-74)										
Low Income	9	45.22	82.56	+37.34	17.33	34.22	+16.89	.324	.406	+.082
High Income	8	42.25	81.13	+38.88	15.38	32.75	+17.37	.346	.399	+.053
All Subjects	17	43.82	81.88	+38.06	16.41	33.53	+17.12	.334	.403	+.069
Cohort 2 (in 1974-75)										
Low Income	4	47.0	59.5	+12.5	11.25	20.25	+ 9.0	.209	.326	+.117
High Income	13	68.0	75.69	+ 7.69	26.62	37.38	+10.76	.349	.505	+.156
All Subjects	17	63.06	71.88	+ 8.82	21.47	33.35	+11.88	.316	.463	+.147
Cohort 3 (in 1975-76)										
Low Income	12	58.0	69.67	+11.67	21.92	23.08	+ 1.16	.366	.293	-.073
High Income	14	59.64	89.0	+29.36	21.14	36.21	+15.07	.330	.378	+.048
All Subjects	26	58.88	80.08	+21.20	21.50	30.15	+ 8.65	.347	.339	-.008
All Cohorts										
Low Income	25	51.64	72.68	+21.04	18.56	26.64	+ 8.08	.326	.339	+.013
High Income	35	58.77	82.26	+23.49	21.86	35.85	+13.99	.341	.430	+.089
All Subjects	60	55.80	78.27	+22.47	20.48	32.04	+11.53	.334	.392	+.058

1. PSIS: Peer Social Interaction Score
2. PI, Q-ES: Peer Interaction, Quality-Effectiveness Score

Table 4

Mean PSIS[1], PI,Q-ES[2] and ratios of PI,Q-ES/PSIS by Cohort, Income Group and Time for the second year in preschool.

Cohort	n	PSIS			PI, Q-ES			Ratio of PI,Q-ES/PSIS		
		Fall	Spring	Diff	Fall	Spring	Diff	Fall	Spring	Diff
Cohort 1 (in 1974-75)										
Low SES	8	75.38	101 00	+25.62	24.38	51.25	+26.87	.322	.488	+.166
High SES	6	76.67	116.67	+40.0	31.17	72.33	+41.16	.386	.610	+.224
All subjects	14	75.93	107.72	+31.79	27.29	60.28	+32.99	.349	.540	+.191
Cohort 2 (in 1975-76)										
Low SES	4	54.00	88.50	+34.5	20.75	44.50	+23.75	.359	.508	+.149
High SES	11	91.00	103.63	+12.63	41.0	52.73	+11.73	.444	.476	+.032
All subjects	15	81.13	99.60	+18.47	35.6	50.54	+14.94	.421	.485	+.064
Cohort 3 (in 1976-77)										
Low SES	12	67.83	85.08	+17.25	32.17	38.08	+ 5.91	.460	.433	-.027
High SES	9	82.33	95.33	+13.0	42.11	55.77	+13.66	.507	.574	+.067
All Subjects	21	74.04	89.47	+15.43	36.43	46.66	+ 9.23	.480	.493	+.013
All Cohorts										
Low SES	24	68.04	90.96	+22.92	27.67	43.54	+15.87	.397	.464	+.067
High SES	26	84.69	103.77	+19.08	39.12	58.31	+19.19	.452	.541	+.089
All SO	50	76.70	97.62	+20.92	33.62	51.22	+17.60	.425	.504	+.079

PSIS = Peer Social Interaction Score
PI, Q-ES = Peer Interaction, Quality-Effectiveness Score

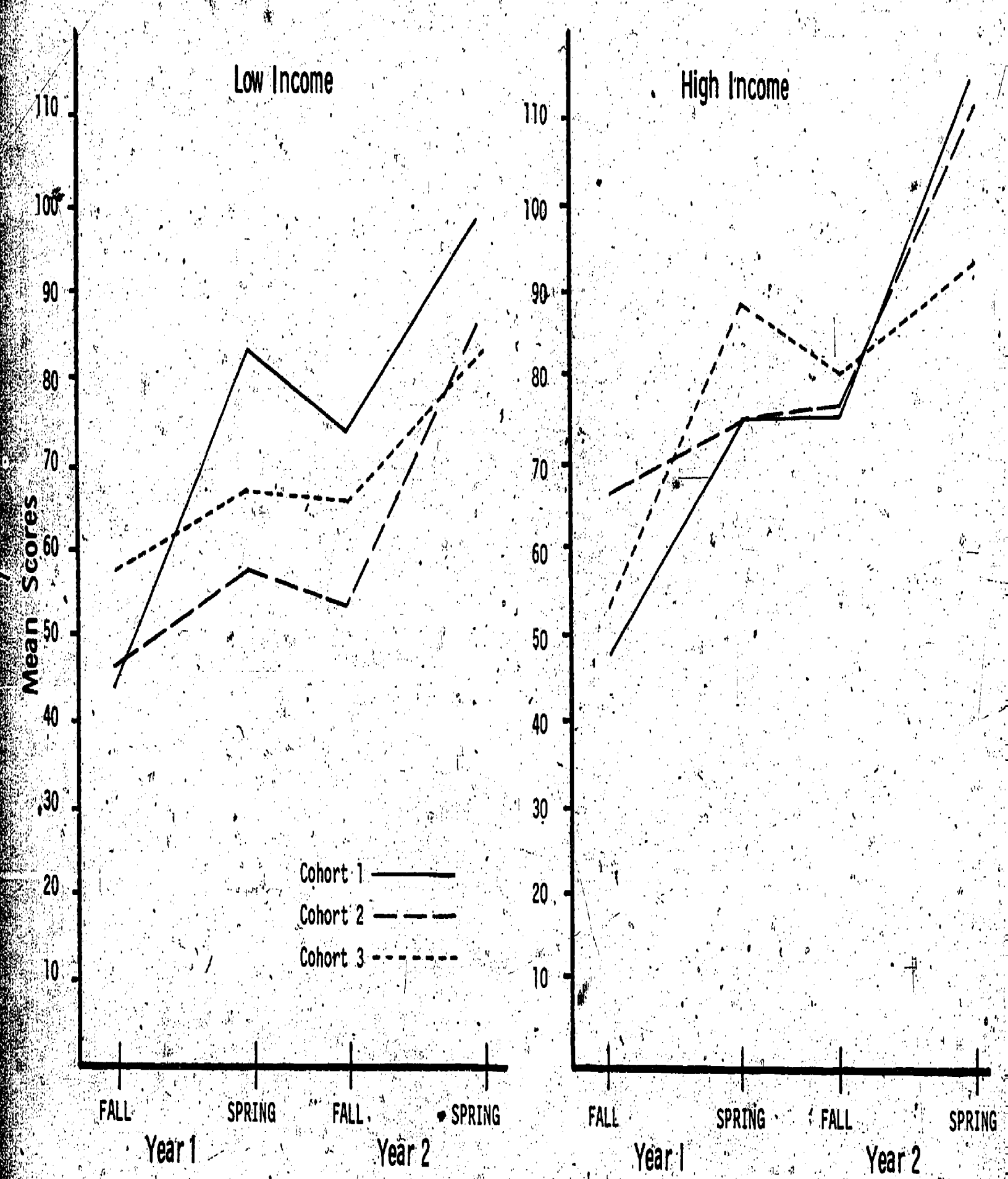
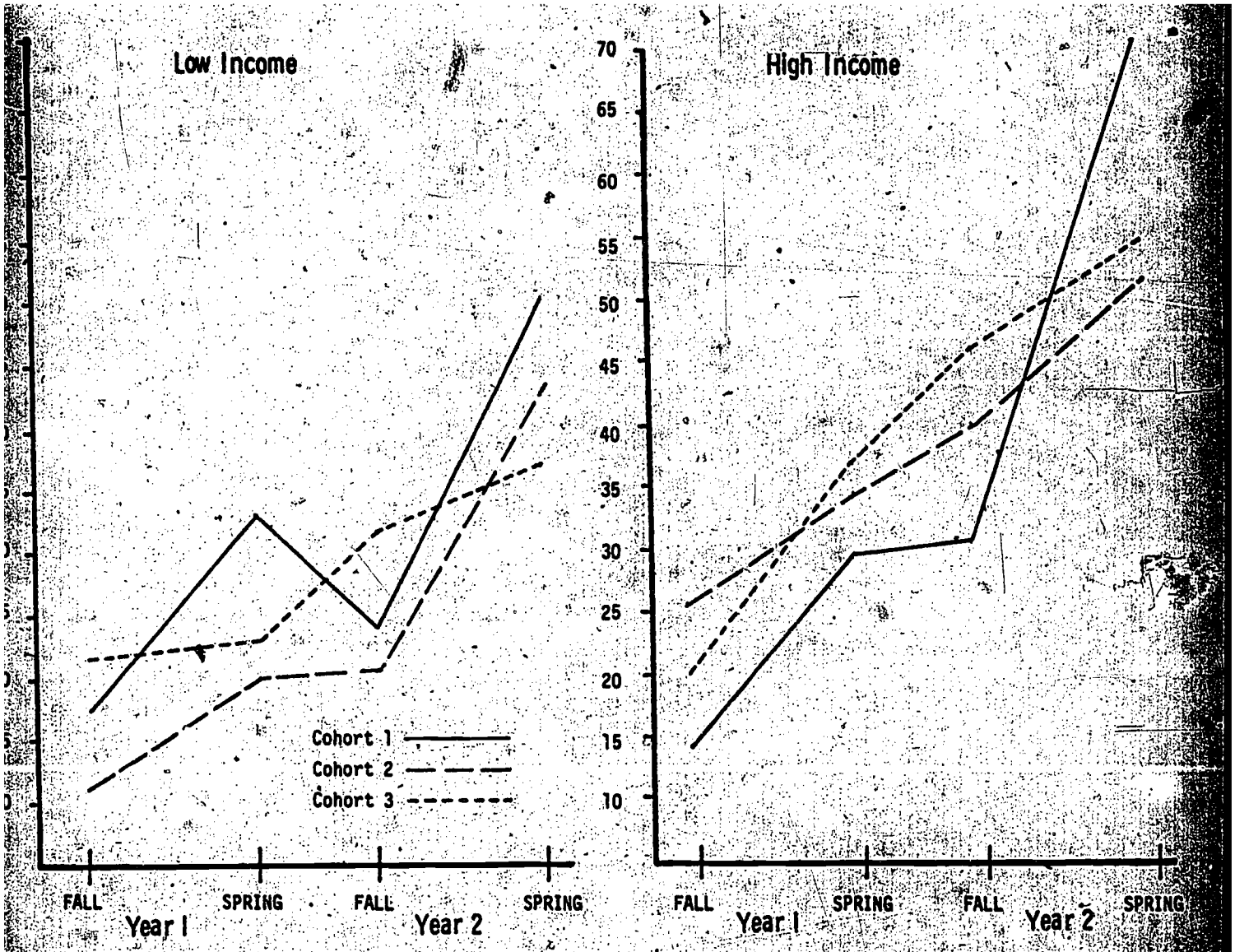


Figure 1. Changes in the mean Peer Social Interaction Scores (PSIS)over time by Income Group & Cohort



igure 2. Changes in the mean Peer Interaction, Quality-Effectiveness Scores (PI, Q-ES) over time by Income Group & Cohort

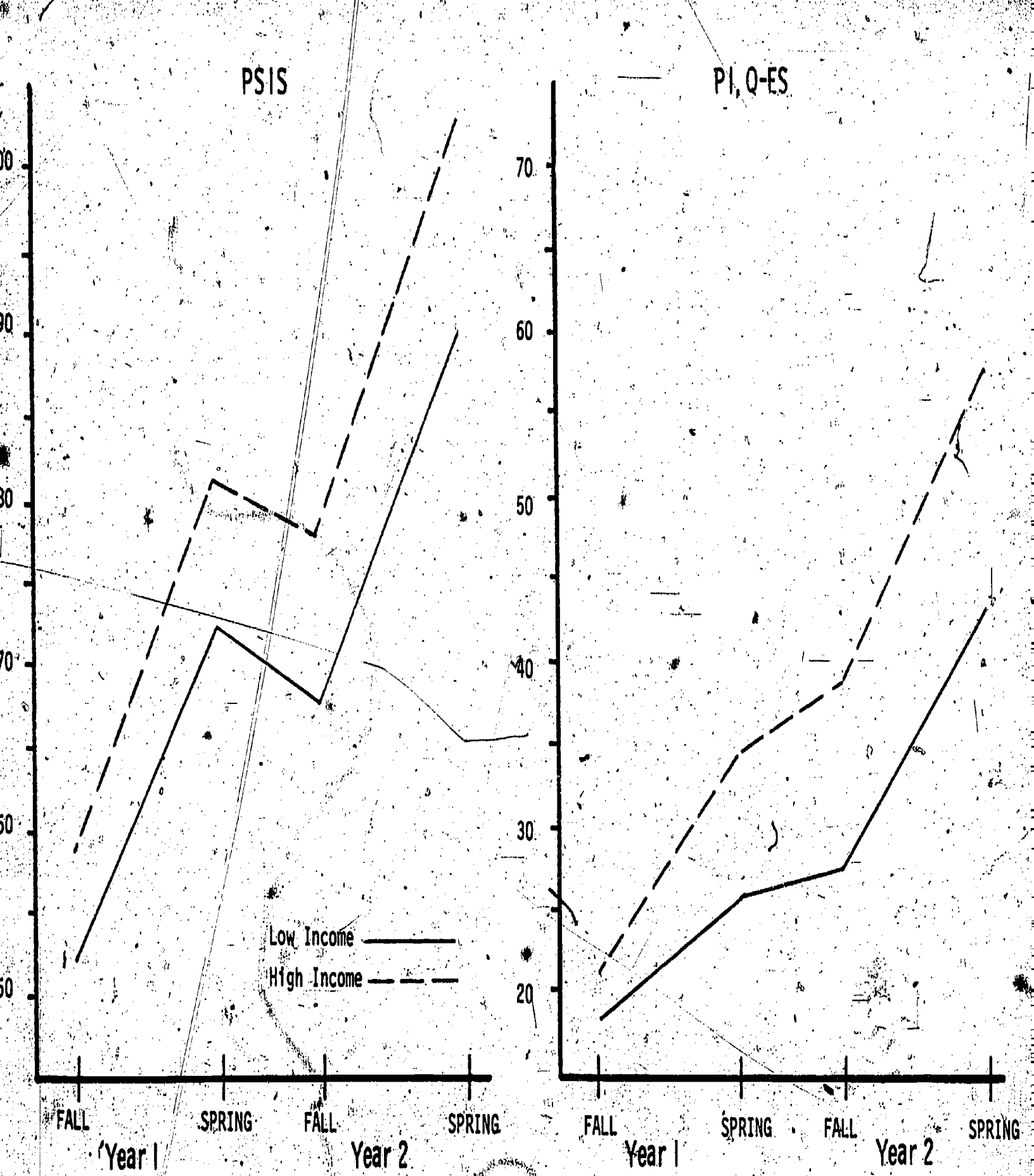


Figure 3. Changes in the social interaction scores (PSIS and PI, Q-ES) over time by Income Group.

gains made by Cohort 1 were greater than those of Cohort 2 ($p < .001$) and Cohort 3 ($p < .01$). The gains made by cohorts 2 and 3 were not significantly different. The analysis of the PI,Q-ES data yielded a main effect for Time, $F(1,54) = 24.57$, $p < .0001$, but no Cohort x Time interaction effect indicating that all cohorts had made significant gains. Thus the apparent trend toward greater gains for Cohort 1 than Cohorts 2 and 3, which can be seen in Table 3, was not large enough to be significant. The analysis of the ratio of PI,Q-ES to PSIS scores yielded a main effect for Time, $F(2,57) = 7.25$, $p < .01$ and a Cohort x Time interaction effect, $F(2,57) = 4.56$, $p < .01$. The scores of Cohorts 1 and 2 had increased from fall to spring, but those of Cohort 3 had decreased. A separate 2(Income Group: low,high) x 2(Time: fall, spring) ANOVA on the scores for Cohort 3 yielded a significant Income Group x Time interaction effect, $F(1,24) = 4.03$, $p < .05$ indicating that the scores of the high-income group had increased, but those of the low-income group had decreased on this measure.

Second year in preschool. The analysis of the PSIS data yielded main effects for Income Group, $F(1,44) = 4.25$, $p < .05$ and Time, $F(1,44) = 24.08$, $p < .0001$, but no Cohort x Time interaction effect. The scores of the high-income subjects were higher than those of the low-income subjects, but both groups made significant gains. The ANOVA on the PI,Q-ES data yielded main effects for Income Group, $F(1,44) = 8.45$, $p < .01$ and Time, $F(1,44) = 31.6$, $p < .0001$ and a Cohort x Time interaction effect $F(2,44) = 3.82$, $p < .05$. The scores of the high-income subjects were higher than those of the low-income subjects. The scores

of all cohorts increased over time, but Cohort 1 gained significantly more than Cohorts 2 and 3 and the gains made by Cohorts 2 and 3 were not significantly different. The ANOVA on the ratio of the PI,Q-ES/PSIS scores also yielded main effects for Income Group, $F(1,44) = 6.23$, $p < .025$ and Time, $F(1,44) = 21.21$, $p < .0001$ and a significant Cohort x Time interaction effect, $F(2,44) = 5.32$, $p < .001$. The scores of the high-income subjects were higher than those of the low-income subjects. The scores of all cohorts increased but Cohort 1 gained more than either Cohort 2 ($p < .01$) or Cohort 3 ($p < .001$) and Cohort 2 gained more than Cohort 3 ($p < .05$).

Summary of findings and discussion. These results can be summarized as follows:

(1) All cohorts made significant PSIS and PI,Q-ES gains in both their first and second preschool years.

(2) Cohort 1 made greater PSIS gains than the other two cohorts in the first preschool year and made greater PI,Q-ES and ratio of PI,Q-ES/PSIS gains than the other two cohorts in the second preschool year. These findings were the same for both income groups considered separately in the second, though not the first, year.

(3) The differences between the income groups were relatively small in their first year in preschool, but the mean scores of the high-income group were higher than those of the low-income group when they were in their second preschool year.

Program Effects. The finding that the subjects in Cohort 1 increased their social competence over time more than did the subjects in the other

two Cohorts suggests that the less structured programs offered in the first and second years of the project were more effective in supporting social development than were the more structured programs offered in the second two years. The increase in the peer interaction rate (reflected by the PSIS) in the Cohort 1 children, during their first preschool year, suggests that the informal program stimulated more peer interaction than did the more structured programs. It is noteworthy that even when the program became somewhat more structured, these Cohort 1 children continued to increase their social skills (as evidenced by their greater PI,Q-ES gains), in their second preschool year, at a greater rate than did the Cohort 2 and 3 children. A possible interpretation of this finding is that these children continued to benefit, in the second year, from the extra social experience they had in their first preschool year.

Social data were available for nine three-year-old external (day nursery) controls, during their first nursery year, who were also in informal programs. The PI,Q-ES gains made by these children were almost as great as those made by Cohort 1 and were greater than the gains made by Cohorts 2 and 3. This finding also supports the view that less structured programs are likely to be more supportive of social development than are more structured programs.

Compensatory effects. It is clear that the low-income children were making significant and impressive gains, but the differences between the low- and the high-income children, although small at the start, increased over time.

These results may be accounted for in part by the fact that both the PSIS and the PI, Q-ES have been found to be positively correlated with intelligence and cognitive competence (Wright 1977, 1977a), and (as is reported in a later section) the high-income children had higher IQs and better cognitive abilities than the low-income children. However, they may be due also to the fact that the children were learning skills which were equally new to both income groups. The fact that the groups started out at about the same ability level suggests that this was the case. It was expected that when opportunities for learning were provided, which were just as new for the high- as the low-income children, that even though the low-income subjects would make substantial progress the likely-to-be-better-equipped high-income children would make greater gains and the differences between the groups would increase rather than decrease over time. The present findings are consistent with these expectations. The gains made by the low-income subjects were substantial, however, and appear to represent a level of achievement equal to, or greater than, that of the high-income subjects when this is evaluated in terms of the estimated learning ability of the two groups.

Motivational Characteristics and Cognitive Styles

Three tests in this area (Circus: Think it Through, Circus: Make a Tree and the Kansas Reflection-Impulsivity Scale) were not included in the test battery in the first year. Hence no data on first-year-

in-preschool performance for Cohort 1 were available. Teacher ratings were, however, obtained for all subjects in all cohorts.

(1) Circus: "Think it Through" (Problem Solving)

First year in preschool. There were no cohort effects. On the total score there were main effects for Time, $F(1,39) = 24.96$, $p < .0001$ (Spring scores higher than fall scores) and Income Group $F(1,39) = 15.20$ $p < .001$ (high-income scores greater than low-income scores). There was, however, an Income Group x Time interaction effect $F(1,39) = 6.61$, $p < .025$ for the Problem Identification sub-score which showed that although the scores of the high-income subjects were greater than those of the low-income subjects in the fall this difference was eliminated by the spring.

Second year in preschool. There was a significant Cohort x Income-Group x Time interaction effect on the Solution Evaluation sub-score $F(1,44) = 38.54$, $p < .0001$. In Cohort 1 the high and the low income groups started out equal, but by the spring the scores of the high- were greater than those of the low-income subjects. In Cohort 2 the high-income group started with a higher score than the low-income group, but by the spring this difference had disappeared (i.e. the level of performance of the high-income subjects did not change much and the low-income children "caught up"). In Cohort 3 the high-income group started with a higher score than the low-income group, but both groups made about equal gains and the difference between them was the same in the spring as in the fall. However, on the total "Think it Through" scores

there were no cohort effects. There were simply main effects for Time $F(1,44) = 25.33$ $p < .0001$ (spring scores higher than fall scores) and Income Group $F(1,44) = 13.17$ $p < .001$ (high-income scores greater than low-income scores).

Changes in the performance of the two income groups (all cohorts combined) over time are shown in Figure 4. It will be noted that the

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Insert Figure 4 about here

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over-all trend was toward a reduction in the size of the differences between the income groups. It is also noteworthy that by the end of the two year period the more intellectually able half of the low-income group (those with the highest IQs) had caught up to the high-income subjects (means, high-income 21.25, low-income with highest IQs 20.60), that is their achievement levels were not significantly different.

(2) Circus: "Make a Tree" (Creativity)

First year in preschool. There was only one main effect for Cohort. This was on unusualness $F(1,39) = 9.87$ $p < .005$, showing that Cohort 2 scores were higher than Cohort 3 scores. There was a main effect for Time on Appropriateness $F(1,39) = 5.76$ $p < .025$ (spring scores higher than fall scores). There were, however, no income group effects. The performance of the high and the low-income children was not significantly different.

Second year in preschool. No main effects for Cohort or Time were found. There was, however, one Income Group effect on appropriateness (high-income scores greater than low-income scores) $F(1,44) = 4.21$, $p < .05$.

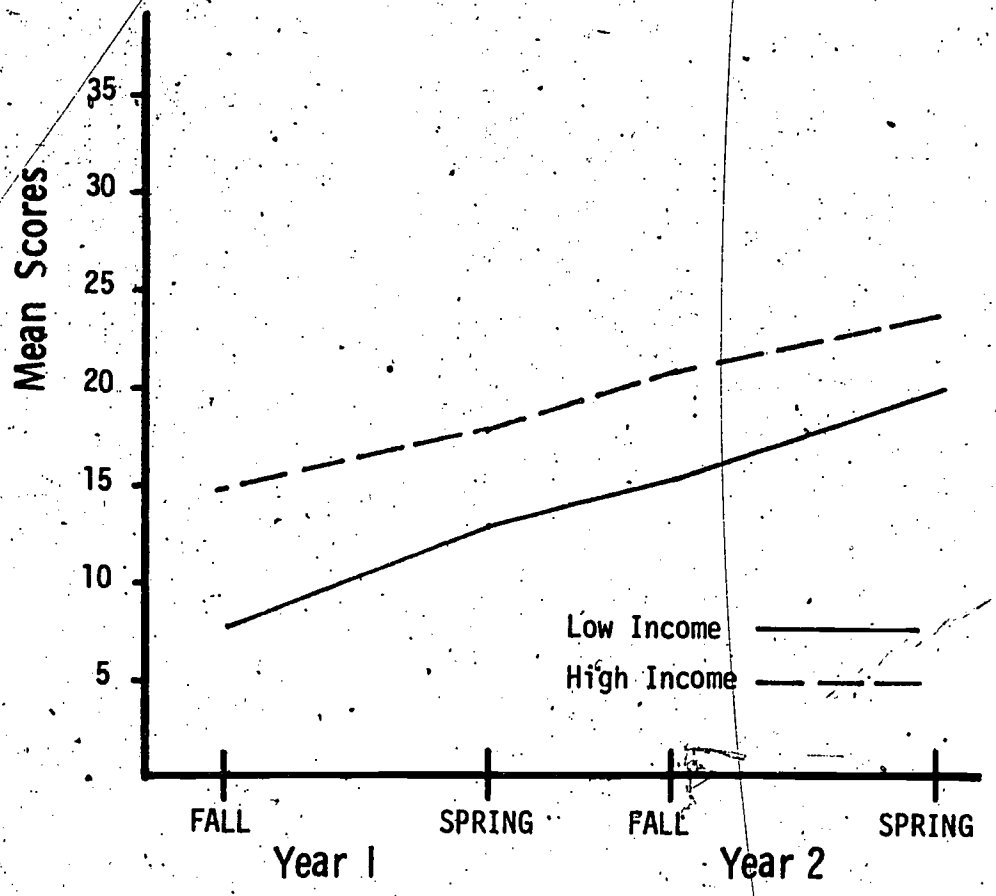

Figure 4. Circus Think It Through (Problem Solving): Changes in the mean scores over time by income group.

(3) The Kansas Reflection-Impulsivity Scale for Preschoolers (KRISP)

First year in preschool. There were Cohort effects on the error, but not the latency scores. On errors there were main effects for Cohort $F(1,34) = 11.40$ $p < .01$ and Time $F(1,34) = 64.87$, $p < .0001$, a Cohort x Time interaction effect $F(1,34) = 18.47$, $p < .001$ and an Income Group effect $F(1,34) = 6.71$, $p < .025$. These findings indicated that the fall error score of Cohort 2 was greater than that of Cohort 3, but their spring scores were about the same and that the high-income subjects had, in general, lower error scores than did the low-income subjects. On latency scores there were main effects for Time $F(1,34) = 18.32$, $p < .01$ (both groups increased their latencies over time) and Income Group $F(1,34) = 4.08$, $p < .05$ (high income latencies were higher than low-income latencies).

Second year in preschool. Analyses of the latency scores yielded no effects of any kind. On error scores there was a main effect for Time $F(1,44) = 44.72$, $p < .0001$ and a Cohort x Time interaction effect $F(2,44) = 5.38$ $p < .01$. At the beginning of the second year Cohort 1 had the highest error score, but in the spring had a score lower than Cohort 3 and about the same as Cohort 2.

There was a main effect for Income Group $F(1,44) = 5.31$, $p < .025$ but also an Income Group x Time interaction effect $F(1,44) = 5.07$, $p < .05$. Although the fall error score of the high-income group was significantly lower than that of the low-income group, the spring scores of the two groups were about the same.

Income group differences (all cohorts combined) in the classification of the subjects by category (reflective, impulsive etc.) are shown in

Table 5.* It will be noted that more of the low- than the high-income

Insert Table 5 about here

subjects were impulsive, but that this difference was reduced over time. Whereas at the beginning of their second year ten of the low-income (42%) and 5 of the high-income (19%) subjects were still impulsive, at the end of that year only 4 of the low-income (17%) and one of the high-income subjects (4%) were impulsive.

(4) Teacher Ratings

First preschool year. There were Cohort x Time interaction effects on five of the six measures (all but Self-direction). In every case these indicated that Cohort 1, although rated lower than the other two cohorts in the fall, received the highest ratings in the spring, suggesting that the children in this cohort had made the greatest performance gains. The statistical reliability of these effects were as follows: Mastery $F(1,54) = 34.13$, $p < .0001$, Self-management $F(1,54) = 30.01$, $p < .0001$, Curiosity $F(1,54) = 37.51$, $p < .0001$, Creativity $F(1,54) = 6.86$, $p < .01$, Imagination $F(2,54) = 3.28$, $p < .04$. Furthermore, on Imagination there was also a Cohort x Income Group interaction effect $F(2,54) = 3.28$, $p < .05$ and a Cohort x Income Group x Time interaction effect $F(2,54) = 3.90$ $p < .05$. The low income subjects in Cohort 1 gained more than any other income group in any cohort and by the end of the year were rated as being slightly more imaginative than their high-income counterparts.

There were significant Time effects on all six measures indicating that all of the cohorts made significant gains and there was an Income Group effect on only one measure. This was Creativity (high-income children rated higher than low-income children) $F(1,54) = 6.86$, $p < .01$

Table 5

Number of subjects in each KRISP Category at each testing time by income group

	Low-Income				High-Income			
	Year 1		Year 2		Year 1		Year 2	
Category	Fall	Spring	Fall	Spring	Fall	Spring	Fall	Spring
(untestable)	5	0	0	0	0	0	0	0
Very reflective	0	0	0	0	1	3	0	0
Reflective	0	1	0	1	1	5	4	1
Average	1	5	8	6	7	1	5	4
Fast Accurate	4	8	6	13	3	11	12	20
Impulsive	4	1	8	3	5	0	3	1
Very Impulsive	2	1	2	1	3	0	2	0
No. S's tested	16	16	24	24	20	20	26	26

Second preschool year. There were main effects for Cohort on two measures which showed that Cohort 1 continued (during the second year) to be rated more highly than the other two cohorts (with Cohort 2 rated higher than Cohort 3). These were Self direction $F(2,44) = 3.34$ $p < .05$ and Curiosity $F(2,44) = 14.46$ $p < .001$. However, Cohort 1 did not maintain its superior ratings on all measures. There were significant Cohort x Time interaction effects on Self-management $F(2,44) = 24.93$ $p < .0001$ and Imagination $F(2,44) = 12.28$, $p < .001$. On these the ratings of Cohort 1 fell from the highest, in the fall, to the lowest, in the spring, of all three cohorts. It was Cohort 3 that made the greatest gains on these measures in the second preschool year.

There were significant main effects for Time on Mastery, Curiosity and Creativity indicating that all of the cohorts made significant gains. In this year Income Group effects were again found for Creativity $F(1,44) = 11.54$, $p < .005$, and emerged also for Mastery $F(1,44) = 3.98$, $p < .05$ and Self-management $F(1,44) = 3.88$ $p < .05$, (high-income scores greater than low-income scores).

Summary and discussion. The value of these findings for assessing the effects of the changes in the program from year 1 to year 2 was limited, because the Cohort 1 data for year 1 were incomplete. However, besides looking at the teacher ratings of performance (which were complete) it was possible to compare the test performance of Cohort 1 with that of the other two cohorts at the start of the second preschool year.

As judged by teacher ratings, Cohort 1 children improved during their first preschool year in Mastery motivation, Self management skills, Curiosity, Creativity and Imagination more than did the children in either of the other two cohorts. This suggests that the more informal program

offered to Cohort 1 may have been more effective in improving these types of learning and problem solving styles than were the more structured programs offered in subsequent years.

At the beginning of the second year the overall performance of the three cohorts on "Think it Through" was about the same. However, the low-income subjects in Cohort 1 had initial solution evaluation sub-test scores which (unlike the low-income children in the other two cohorts) were equal to those of their high-income counterparts. There were no cohort differences on "Make a Tree", but there were such differences on the KRISP. Cohort 1 had the highest KRISP error scores of any cohort, and the percentage of subjects who were still performing impulsively was greatest in Cohort 1 (42.8% as compared with 20% in Cohort 2 and 33.3% in Cohort 3). This finding was consistent with the results obtained at the end of the first year, using a different test of impulsivity, which indicated that the informal program had not been very effective in reducing impulsivity especially in the low-income children.

Regarding socio-economic differences and the compensatory effects of the program, it is noteworthy that, when the children were in their first preschool year the teachers judged the low-income subjects to be just as self-directed, motivated to achieve, curious and imaginative (though not as creative or, at the start, as self-controlled), as were the high income subjects and, when they were in their second year, again judged them to be about the same as the high income subjects on everything except creativity, self-management and, at this level, also mastery. It is also noteworthy that although the teachers consistently judged the

low-income groups to be less creative, their performance on Circus Make a Tree (a test of creativity) was not significantly different from that of the high-income groups.

The largest initial income group differences were found with the KRISP. Significantly more of the low than the high-income subjects were impulsive on this test and while the informal program in the first year did little to modify such behavior the more structured programs were quite successful in doing so. Finally there were significant income group differences which favoured the high-income group on problem solving. However, these decreased over time and were eliminated at least in the more intellectually able half of the low-income sample.

Intellectual and Cognitive Abilities

Three tests in this area (the Binet, Circus "Say and Tell", and Circus "How Much and How Many") were not given during the first year of the project. Therefore, data on the performance of Cohort 1 subjects on these tests was not obtained during their first preschool year. The Preschool Inventory data were, however, complete.

(1) Preschool Inventory

First year in preschool. There were significant Cohort x Time interaction effects on two sub-scores: (a) "Don't Know" $F(1,54) = 4.39$, $p < .02$ and (b) Concept Numerical $F(1,54) = 4.14$ $p < .02$. During their first year in preschool both Cohorts 2 and 3 reduced their "Don't Know" scores and increased their Concept Numerical scores from fall to spring more than did Cohort 1. On the Concept Numerical scores there was also a significant Cohort x Income Group x Time interaction effect $F(2,54)$

= 4.94, $p < .01$. Although the low-income subjects in Cohorts 2 and 3 gained more in "number" than their low-income counterparts in Cohort 1, the high-income subjects in all three cohorts made similar gains.

There were main effects for Income Group and Time on the total score and all of the sub-scores. The high-income subjects scored higher than the low-income subjects, but both groups made significant gains. There were also Income Group x Time interaction effects on both the "Don't Know" score $F(1,54) = 9.41$ $p < .004$ and the Concept Sensory score $F(1,54) = 4.33$, $p < .04$. In each case the low-income subjects improved more than the high-income subjects and the difference between them was reduced.

Second-year-in-preschool. The analyses of the data for this year yielded no significant cohort effects. All three cohorts made significant, but comparable gains from fall to spring on the total score and all of the sub-scores.

In general the high-income subjects continued to perform better than the low-income subjects, but there were significant Income Group x Time interaction effects on the Total score $F(1,44) = 7.32$, $p < .01$ and three sub-scores: Personal-social $F(1,44) = 16.09$, $p < .001$, Concept-numerical $F(1,44) = 5.24$, $p < .05$ and Concept-sensory $F(1,44) = 11.78$, $p < .005$. In all cases the low-income subjects made greater gains from fall to spring than did the high-income subjects and the differences between the groups were reduced. The gradual reduction in the size of the differences in the over-all performance of the high- and low-income children on this test over time is shown by cohort in Figure 5. Changes

Insert Figures 5 & 6 about here

in the mean scores of the subjects (all cohorts combined) in each income group are shown in Figure 6. It is also worth noting that, at the last testing time, the over-all performance of the more intellectually able half of the low-income group was not significantly different from that of the high-income group (Means: high-income 57.2; more able low-income 53.75). The difference between the high-income children and the less able low-income children had also been reduced (mean of less able low-income = 44.50).

(2) Binet IQ

The mean Binet IQs obtained at each assessment time are shown by Cohort and income group in Table 6. The low-income subjects in Cohort 2

Insert Table 6 about here

appeared to make the greatest gains, but no main effects for Cohort were found, suggesting that the changes made in the program did not have a differential effect on IQ gains.

At every testing time the mean IQ of the high-income group was greater than that of the low-income group. Both groups made significant gains and although there was a trend toward greater IQ gains in the low- than in the high-income group (over the two academic years, on the average 16 as compared with 9 IQ points) this difference was not large enough to be significant.

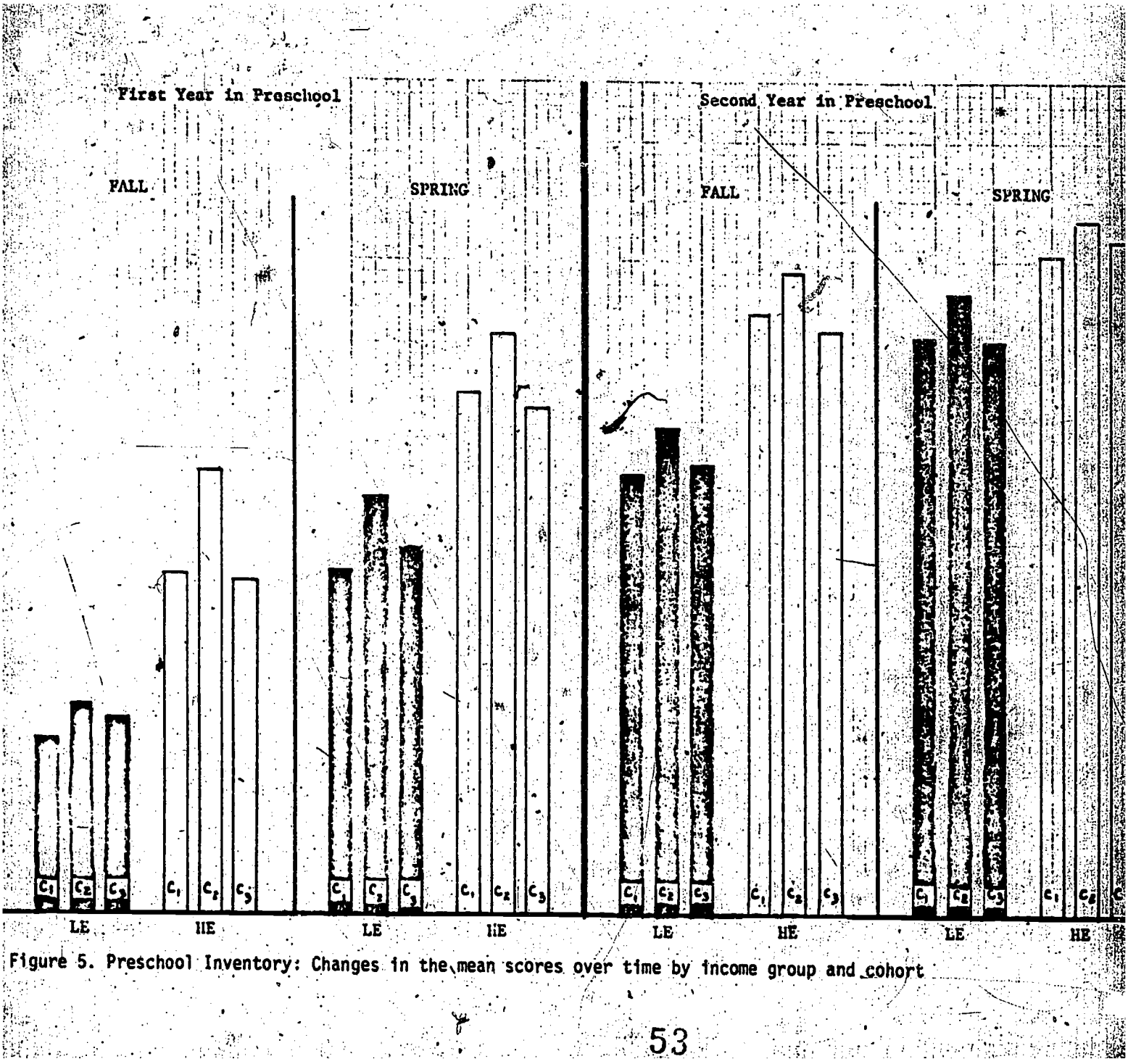

Figure 5. Preschool Inventory: Changes in the mean scores over time by income group and cohort

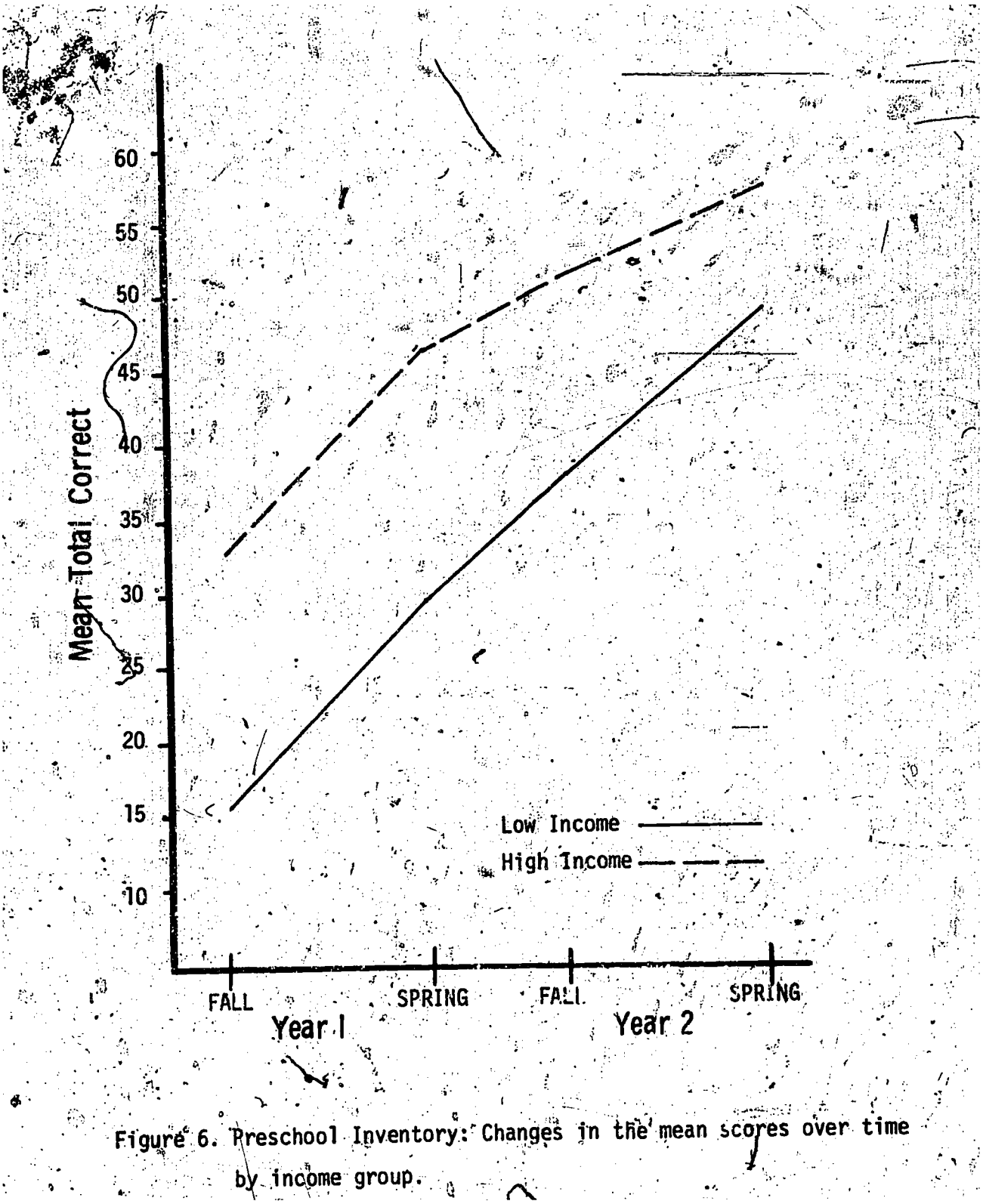

Figure 6. Preschool Inventory: Changes in the mean scores over time by income group.

Table 6

ean Binet IQ and range of scores at each testing time by Cohort and Income Group.

	First Year In Preschool			Second Year In Preschool		
	n	Fall	Spring	n	Fall	Spring
ohort 1						
Low Income	9			8	95 (77-108)	104 (86-130)
High Income	8			6	111 (102-121)	118 (91-129)
All S's	17			14	102 (77-121)	110 (86-130)
ohort 2						
Low Income	4	86 (77-91)	100 (93-110)	4	93 (82-108)	106 (104-108)
High Income	13	114 (94-134)	118 (102-136)	11	118 (101-132)	120 (101-135)
All S's	17	107 (77-134)	113 (93-136)	15	111 (82-132)	117 (101-135)
ohort 3						
Low Income	12	88 (68-112)	96 (75-118)	11	98 (74-126)	100 (85-120)
High Income	14	106 (62-129)	113 (74-145)	9	114 (86-130)	117 (92-134)
All S's	26	97 (62 129)	105 (74-145)	20	105 (74-130)	108 (85-134)
ll Cohorts						
Low Income	16	87 (68-112)	97 (75-118)	23	96 (74-126)	103 (85-130)
High Income	27	110 (62-134)	115 (74-145)	26	115 (86-132)	119 (91-135)
All S's	43	101 (62-134)	108 (74-145)	49	106 (74-132)	111 (85-135)

There were, however, wide individual differences in the size of the IQ gains made by individual subjects especially in the low-income group. Of fifteen low-income children who were tested in both their first and second year, five made gains of over 20 IQ points (range 20-28) five made gains of 14 or 15 IQ points, one gained 10 points and the other four made no apparent gains.

The range of scores for the 16 low-income children who were tested in their first-year-in-preschool was, in the fall, 68-112. Nine of these subjects (53.3%) had IQs below normal, but by the end of the year this number had been reduced to four (25%). The range of scores of the 23 low-income subjects tested in their second preschool year was, in the fall, 74-126. Nine of these subjects (39%) tested below normal at the beginning of the year but, by the spring, this number had been reduced to 3 (13%) and none of these three children had scores below 85.

Reference has already been made to data analyses in which the performance of the more- and less-intellectually able subjects in the low-income sample was compared. The reason for splitting the low-income group was as follows. It seemed reasonable to assume that after a full year in preschool and a substantial amount of experience in test situations, the performance of the subjects on the Binet would yield a fairly reliable measure of their IQs. Since IQ provides some measure of learning ability, it was expected that the brighter subjects (with higher IQs) would benefit more from the educational program than the subjects with lower IQs. The 24 subjects were therefore divided into two groups on the basis of the average of the two IQ scores which they each obtained during

their second preschool year. The more able group of 12 subjects (6 of whom were in Cohorts 1 and 2 and 6 in Cohort 3) had a mean IQ of 107 (range 99.5 - 123) and the less able group of 12 subjects had a mean IQ of 90 (range 79-99).

By and large the low-income children with the lowest IQs at preschool entry made the greatest IQ gains. Of the 15 children who were tested in two consecutive years the eight with the lowest scores (IQs 88 or below) gained on the average 19 IQ points, but the seven with the highest scores. (IQ 90 or above) gained on the average 7.4 IQ points.

Although it was the children with the lower IQs who made the largest IQ gains, it was those with the highest IQs who made the greatest gains on the cognitive and academic achievement tests.

(3) Circus: "Say and Tell"

First year in preschool. Analysis of the Cohort 2 and 3 data for their first preschool year indicated that the programs offered them had about the same kind of impact on their language development. There was only one significant Cohort x Time interaction effect. This was on Quality of Narration $F(1,39) = 4.14$ $p < .05$. Cohort 2 made greater gains from fall to spring than Cohort 3, but it will be recalled that more subjects in Cohort 3 than the other two cohorts presented special speech problems and their performance on Narration was lower than that of the subjects in Cohort 2 when they entered the program. However, both cohorts made significant gains during this year.

Second year in preschool. Analysis of the Cohort 1,2 and 3 data for the second year in preschool yielded a significant Cohort x Time interaction effect for Functional Language scores $F(2.44) = 4.84$, $p < .025$. Cohort 1 started with the lowest mean score (40.21 as compared with 49.26 for Cohort 2,

and 48.88 for Cohort 3) but by the end of the year had gained 10.69 points as compared with 6.39 points for Cohort 2 and 0.92 points for Cohort 3.

Regarding the over-all compensatory impact of the program, when the data on all cohorts were combined, it was found that the scores of the high-income subjects were greater than those of the low-income subjects at each testing time, but that the size of the difference between the income groups had gradually decreased over time. On functional language there was a significant Income Group x Time interaction effect $F(1,44) = 6.46$, $p < .025$. The low-income subjects gained more than the high-income subjects. This finding is shown graphically in Figure 7.

Insert Figure 7 about here

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(4) Circus: "How Much and How Many"

First year in preschool. Analysis of the Cohort 2 and 3 data for this year in preschool yielded a significant main effect for Cohort on the Counting sub-score, $F(1,39) = 6.36 < .025$ and a marginal cohort effect on the total score $F(1,39) = 3.94$, $p = .051$. Cohort 2 scored higher than Cohort 3 on both of these measures. There were also significant Cohort x Income Group x Time interaction effects on Counting $F(1,39) = 9.65$, $p < .005$ and the total score $F(1,39) = 8.52$, $p < .01$. On Counting, in Cohort 2, although both income groups made significant gains the low-income group gained more than the high-income group and almost reached equivalence with it. However, in Cohort 3, although the high-income group made significant gains the low-income group seemed to make little progress and the differences between them were greater in the spring than in the fall. On the total score the results were similar with the performance of the two income groups becoming more alike in Cohort 2 and more different in Cohort 3 by the spring testing time.

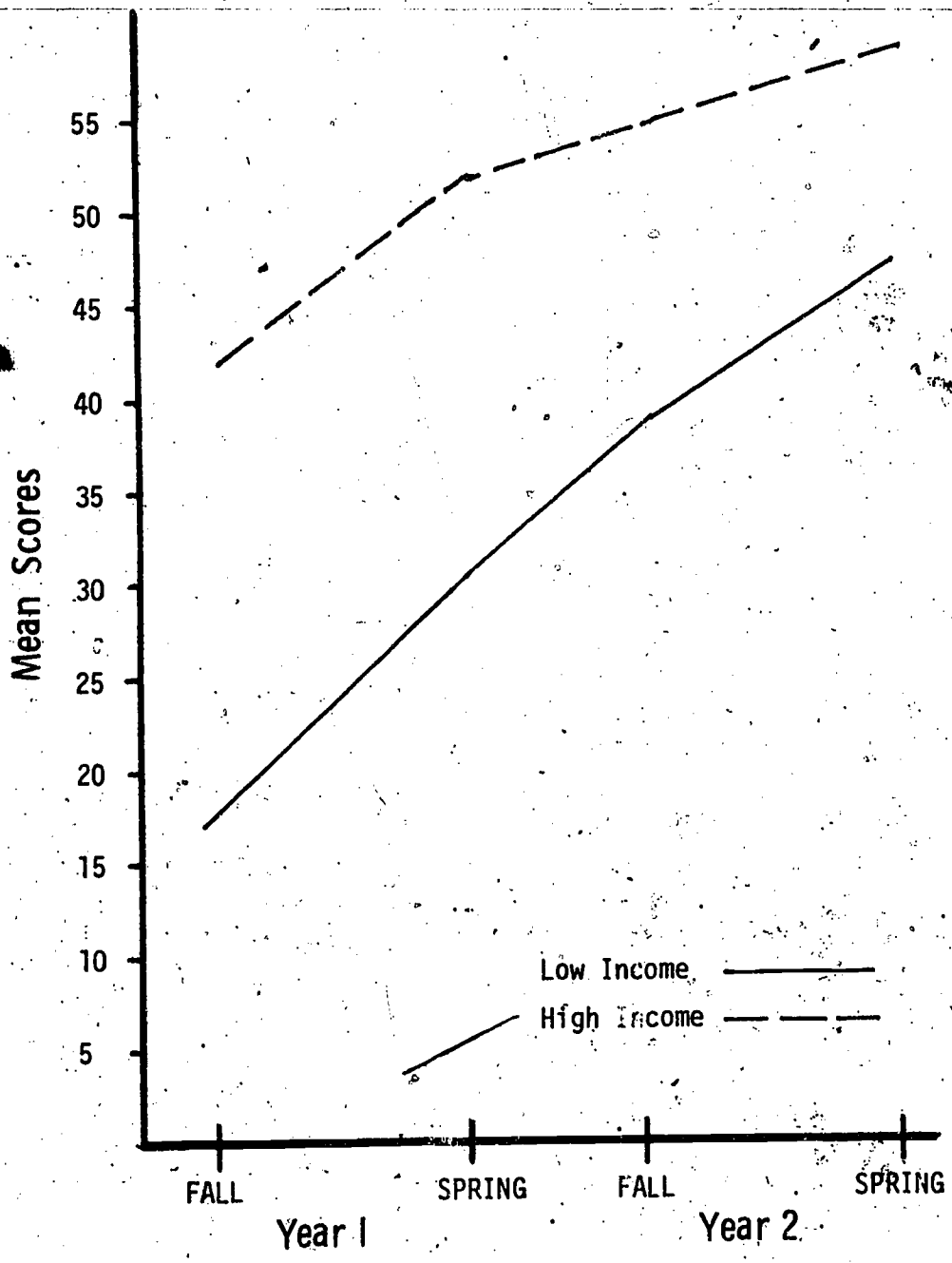

Figure 7. Circus Say & Tell (Functional language): Changes in the mean scores over time by income group.

Second year in preschool. Analysis of the Cohort 1, 2 and 3 data for this year in preschool again yielded significant main effects for Cohort on Counting and the total score, and also on relational terms. For the total score the significance level was $F(2,44) = 3.20$, $p < .05$. The performance of Cohort 2 was superior to that of the other two Cohorts in Counting, Relational Terms and the total score. Cohort 1 and 3 performance was about the same on Relational Terms and the Total score, but Cohort 1 had higher scores than Cohort 3 on Counting.

In Counting, the low-income subjects in Cohort 2 made such great gains, that at the end of the year their scores were equal to those of the high-income subjects, but those in Cohort 1, tended to fall further behind. In the spring the difference between them and their high-income counterparts was greater than it had been in the fall. In Cohort 3, by the beginning of the second year the differences between the low- and high-income groups had begun to decrease, (i.e. were not as large as they had been at the end of the first year) but the low-income subjects seemed to be making progress that was no better than that made by the low-income subjects in Cohort 1.

The poor performance of Cohort 3, relative to Cohort 2, particularly on this test, was difficult to understand in view of the emphasis on number which had been built into the curriculum. The data for this cohort were, therefore, more closely examined and it was found that the cohort contained two subjects whose scores were atypically low, not only on this measure, but also on most of the other measures as well. The means for Cohort 3 with the scores of these two subjects excluded were therefore

calculated. These are presented for the second preschool year in Table 7. For comparative purposes the mean scores for this reduced Cohort 3 sample on the other cognitive measures are also shown, along with the mean scores of the other two cohorts.

Insert Table 7 about here

The results thus obtained made more sense. When the atypical children were excluded, Cohort 3 performance looked as good as Cohort 2 and better than Cohort 1 performance. Ten of the 12 Cohort 3 subjects did well on number. They made greater gains than their high-income counterparts after their first year in preschool, and at the end of the second year had completely "caught-up" to them.

The over-all compensatory impact of the program is shown graphically for all subjects (cohorts combined) in Figure 8. The mean score of the

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Insert Figure 8 about here

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high-income group was greater than that of the low-income group at each testing time. Also in the first academic year, there was a trend toward an increase in the size of the differences between the income groups. However, beginning in the fall of the second year the differences between the groups began to diminish and the performance curves of the two income groups began to converge. It is also again worth noting that, at the last testing time, the performance level attained by the half of the low-income group with the highest IQs was about equal to that of the high-income group. (Mean scores: high-income 33.23; more able half of the low-income sample 30.60).

Table 7

Mean scores on the cognitive measures by Cohort and Income Group for the second year in preschool.

	Low-Income			High-Income		
	n.	Fall	Spring	n.	Fall	Spring
Circus: How Much & How Many						
C1	8	21.5	26.9	6	27.0	34.5
C2	4	25.2	31.0	11	31.9	34.7
C3*	10	23.2	29.2	9	26.9	30.6
Preschool Inventory						
C1	8	37.2	48.5	6	50.3	55.5
C2	4	40.8	52.5	11	54.1	58.4
C3*	10	40.8	51.5	9	48.8	56.7
Circus: Say & Tell (Funct. Lang.)						
C1	8	35.8	49.6	6	44.7	52.2
C2	4	41.2	49.8	11	57.3	61.5
C3*	10	43.8	48.5	9	57.7	59.1

*The means for Cohort 3 are based on the performance of 10 of the 12 subjects (excluding the atypical scores of two slow learners).

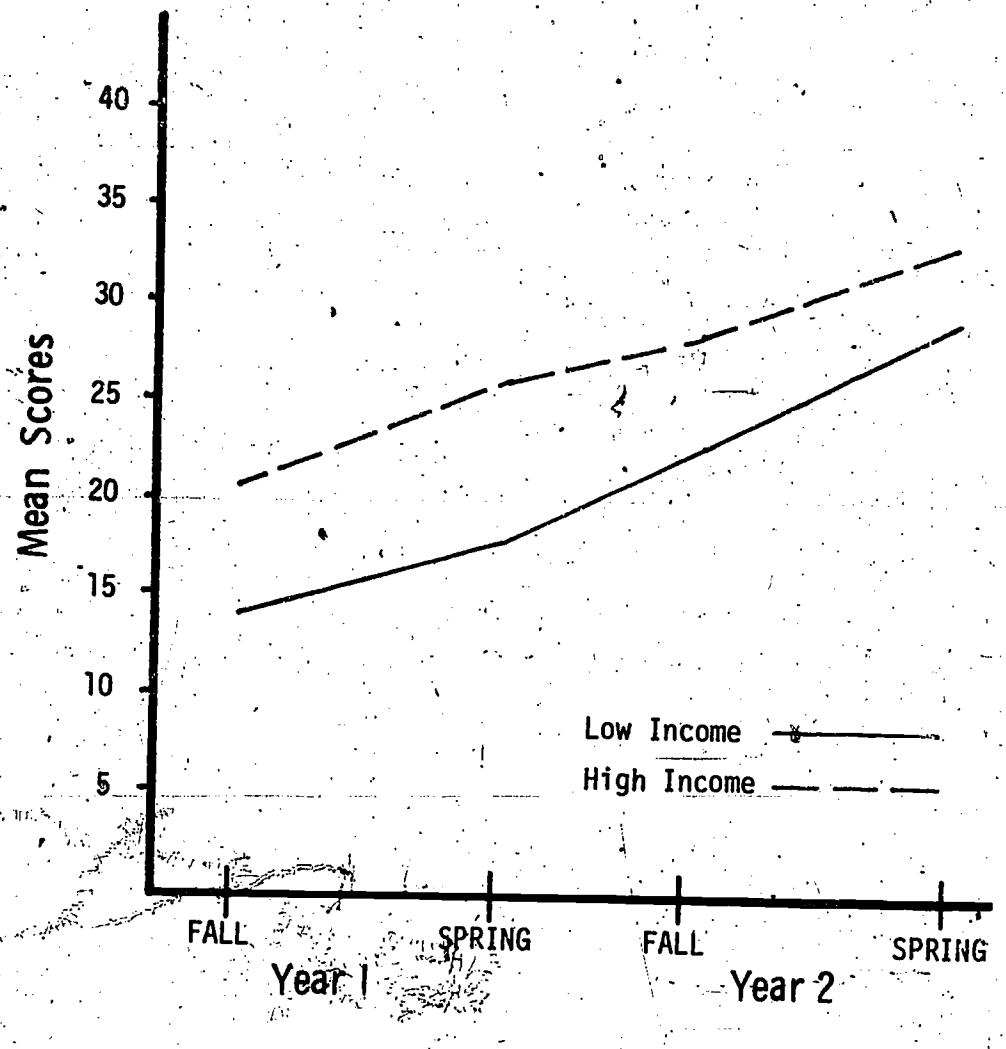

Figure 8. Circus How Much & How Many (Number): Changes in the mean scores over time by income group.

Summary of findings and discussion.

(1) Preschool Inventory: All cohorts made significant gains. The low-income subjects in Cohorts 2 and 3 made greater concept-numerical sub-score gains than did the low-income subjects in Cohort 1 in their first, but not in their second preschool year. The gains made by the high-income subjects in all three cohorts were not significantly different.

The high-income subjects (all cohorts combined) obtained higher scores than the low income subjects at each testing time, but the low-income subjects made greater gains than the high-income subjects, especially in their second preschool year, and the differences between them were greatly reduced.

(2) Binet IQ: All cohorts made significant, but approximately equivalent gains.

The low-income subjects made somewhat greater gains than the high-income subjects but this difference was not large enough to be significant.

There were wide individual differences in the gains made by the subjects, especially in the low-income group, with three quarters of them showing significant gains ranging from 10 to 28 IQ points. However, the IQs of one quarter of the low-income group did not change very much.

(3) Circus: Say & Tell: All cohorts made significant gains. In their second year in preschool Cohort 1 made greater gains in functional language than did either of the other two cohorts but their final performance was about the same.

Although the scores of the high-income subjects were greater than

those of the low-income subjects at each testing time, the low-income subjects made greater gains than the high-income subjects especially in the second year and the differences between them were greatly reduced.

(4) Circus: "How Much and How Many"

The low-income subjects in Cohorts 2 and 3 made on the average greater gains than did their counterparts in Cohort 1.

In Cohort 2 both income groups made significant gains in both the first and the second preschool year but, in the first year, as well as in the second year, the low-income group gained more than the high-income group and the differences between them were greatly reduced.

In Cohort 3 the high-income group made greater gains than the low-income group in the first year. However, in the second year, ten of the twelve low-income subjects, (considered as a group) in this cohort made greater gains than the high-income subjects and by the end of the second year their performance was not significantly different from that of the high-income subjects.

Program Effects. The findings presented in Table 7 suggest that the increase in the emphasis on the cognitive aspects of the program had an effect on the achievements of the low-, though not the high-income children. Most of the low-income subjects in Cohort 3 and those in Cohort 2 had higher scores than their counterparts in Cohort 1 on the cognitive measures at the beginning of the second year and, except in language, maintained this advantage until the end of the year. However, the program changes did not appear to alter the effects on IQ. All three cohorts (and both income groups) made significant, but roughly equivalent, IQ gains.

Compensatory Effects. Over the two year period the low-income children improved their performance relative to that of the high-income children on all of the intellectual and cognitive measures. The greatest IQ and also performance gains, made by both income groups, occurred during the children's first year in preschool. However, during this first year the high-income subjects, more often than not, made greater gains than the low-income subjects, and the differences between the income groups increased. However, during the summer months most of the low-income subjects continued to make gains which were large enough to reduce the size of the differences between the income groups by the fall of the second year. Then, during the second year, on all achievement measures, the low-income subjects made greater gains than the high-income subjects and the differences between the income groups were substantially reduced. In this process the more intellectually-able half of the low-income group played an important role. While their IQs were significantly lower than those of the high-income group, they achieved a level of performance on the cognitive measures which was just about equivalent to that of the high-income group. Over time, as these more able low-income children attained achievement levels comparable to the high-income subjects, the differences between them and the less able low-income subjects greatly increased. On the preschool inventory, Circus "How Much and How Many" and also Circus "Think it Through", but not Circus "Say and Tell" functional language, the differences between the high- and the low-ability low-income children were greater than the differences between the high-income and high-ability low-income children.

Discussion

Program Effects

These results indicated that the less structured, or more informal, program offered in the first year(and to some extent in the second year) of the project, had more beneficial effects on the social development of both the low- and the high-income children than did the more structured programs offered in the third and fourth years. The more informal programs also appeared to be just as effective as the more structured programs in producing IQ gains and improving the children's motivation for learning, their self-management skills and their tendency to be creative and imaginative. They were, however, less effective, at least with the low-income children in improving cognitive styles (i.e. reducing impulsivity) and increasing cognitive competence in conceptual areas.

The fact that the children in the less structured programs increased their social competence more than did the children in the more structured programs was not surprising. Summative evaluations made at the end of the second year of the project suggested that, in the second year, the three-year-olds in the program had made less progress in learning to interact with their peers than had the three-year-olds in the program during the first year. Also formative evaluations of the program, especially those made during the third project year,indicated that the more structured programs were inducing high levels of constructive, task-oriented, but non-social play and increasing the amount of time the children were engaged in activities with a teacher.

One possible explanation for the greater increase in social competence in the Cohort 1 than the Cohort 2 and 3 children is that less teacher control of the children's activities and more time and opportunities for peer interaction in the first project year permitted the Cohort 1 children to obtain, as three year olds, more social experience; that this greater amount of social experience resulted in the acquisition of a greater amount of social knowledge and skill; and that this social learning, in turn, accounted for the more rapid improvement in the quality and effectiveness of their peer interactions, especially when they were four year olds in their second preschool year. Another possible explanation is that the greater amount of social interaction with peers which may have occurred in the first year , provided more cognitive stimulation and increased the cognitive competence of the Cohort 1 children especially in social situations. Since the ability to interact in qualitatively superior and effective ways with peers (as measured by the PI,Q-ES) has been found to be associated with certain types of social understanding and role taking skills (i.e., the ability to know what another person is, for example feeling and thinking) then any improvement in such skills (i.e. social cognition) would be expected to produce greater PI, Q-ES gains (Wright, 1977a) A third poss explanation is that the Cohort 1 children were, from the start, more cognitively competent than the children in the other two cohorts. However, this was clearly not the case. The over-all cognitive abilities of the cohorts did not differ widely, but the one that consistently scored slightly higher than the others was Cohort 2.

The fact that the changes in the program did not affect IQ gains was also not surprising. It has been found repeatedly (Horowitz & Paden, 1973,

Miller & Dyer, 1975) that "well-run preschool programs which differ in many respects can produce comparable intellectual and also cognitive gains. For example, Weikart (1972) found that when three very different types of programs (cognitively-oriented, language-based direct instruction, traditional unit-based) were mounted in his own laboratory, with equal care for quality, they produced equivalent results. Since the UWO programs offered in the four years were alike in more respects than they were different, they were expected to have a more or less equivalent general impact on the intellectual functioning of the children.

Weikart's study (referred to above) led him to conclude that the success of a preschool program depended not so much on its theoretical orientation, but on its over-all quality, and that "quality" was mainly a function of the motivation of the teachers, their active involvement in planning and implementing the program and their determination to make it a success. He suggested that once a program was fully established, running smoothly, and everyone and everything was "organized" it might lose some of its effectiveness. The UWO program was well established by its fourth year and the IQ gains made, during that year, by the low-income subjects (i.e. Cohort 3 in its second year) were not as impressive as before. However, the program did not lose its effectiveness in producing conceptual gains in these same children. In the description of the subjects presented earlier it was pointed out that the low-income subjects in Cohort 3 represented a somewhat more culturally and economically disadvantaged group than did the low-income subjects in the first two cohorts and that the families in Cohorts 1 and 2 had received more favourable treatment during the project than had the families in Cohort 3. It was thought, therefore, that the

low-income Cohort 3 children might not respond to the program as well as their counterparts in the first two cohorts. This was not, however, the case. When the conceptual gains made by the 12 "scholarship" (Cohorts 1 and 2) children and the 12 "subsidized" (Cohort 3) children were compared no significant differences were found.

The finding that greater cognitive benefits were derived by the low-income children in the more, than the less structured programs is consistent with the findings of a number of other investigators. It appears that children from homes in which the parents provide relatively little cognitive stimulation, can be greatly helped to develop their conceptual abilities if they are given individual attention and stimulation by a teacher who is both interested in them and sensitive to their needs.

Finally it is perhaps worth noting that the Cohort which made the greatest cognitive gains was Cohort 2 and that this Cohort was in a somewhat less structured program in its first preschool year and a more structured program during its second preschool year. The subjects who made the smallest cognitive gains were the least able (with lowest IQs) low-income children in Cohort 3 and these children were in the more structured programs in both their first and second preschool years. It may be that the teacher-guided small group activities in which these slow-learners were involved when they were three-year-olds discouraged them, or in some way affected them adversely rather than favourably. It may be wiser, therefore, to offer three-year-old children from low-income families who have low IQs (70 or below) more time for free play and "discovery" learning, during their first preschool year and to delay offering very much in the way of small group teacher-guided

activities, which focus on the development of conceptual abilities, until they are four-year-olds in their second preschool year.

Compensatory Impact

While there were modest cohort effects, as discussed above, the size of each income group in each cohort was small, and some of the reported income group effects may have been spurious. Therefore, in evaluating the overall compensatory impact of the program the subjects in each income group in all three cohorts were combined.

It was hypothesized earlier that, if the high-income children had higher IQs than the low-income children (suggesting that they had more learning ability) then, if equal opportunities were offered for learning "new" skills the initial performance of the income groups would be similar, but the performance gains would be different, with the high-income children making greater gains than the low-income children. If, on the other hand, opportunities for acquiring abilities which were already present in the homes of the high-, but not in the homes of the low-income children were offered the initial performance levels of the income groups would be very different (with the high-income children obtaining higher scores than the low-income children), but over time the low-income children would make greater gains than the high-income children and the differences between their performance levels would decrease. It was therefore argued that if the initial differences found between the income groups did not increase over time and, particularly if these differences decreased, then the conclusion that the program had had compensatory effects was justified.

The initial differences between the high- and the low-income children were greatest in the cognitive areas, including cognitive style (impulsivity) and smallest in the social, motivational, and learning styles areas. This suggested that the high-income children had had more cognitive stimulation, but no more opportunities for social learning in their homes than had the low-income children and that the environment of both income groups had been more or less equally supportive of the development of learning styles such as self-direction, mastery motivation, and curiosity. The results were therefore in line with the hypothetical predictions made above.

The program had its greatest compensatory effects in the intellectual and cognitive areas. The reduction in the size of the differences between the mean IQs of the income groups over time was not large, in spite of the fact that three quarters of the low-income subjects made significant and very large IQ gains. This was because the high-income subjects who were not expected to increase their IQ scores very much, also made significant gains. When the size of the difference in the IQ level of the groups is taken into account the educational achievements (language and conceptual learning) accomplished by the low-income children, relative to the high-income children, are remarkable. While there was a tendency on some measures (e.g. Circus: How Much and How Many) for the performance curves of the income groups to diverge by the end of the first year, they invariably began to converge in the second year. That is, the low-income subjects made greater gains than the high-income children and began to "catch-up". By the end of the two year period the differences between the income groups on all of the cognitive measures had been

reduced. In no case had they increased and the more intellectually able half of the low-income children (with average or better IQs in their second preschool year) had, in most instances completely caught up to the high-income children. It should also be emphasized that none of these findings could be accounted for in terms of ceiling effects.

It was in the social area that the program did not seem to have compensatory effects, in the sense that it made up for opportunities for learning available to the high but not to the low-income children. Both income groups appeared to be learning "new" skills. Their abilities at the start were roughly equal, but over time, the high-income children made greater gains than the low-income children and they became less rather than more like them. Both of the measures of social competence, especially the PI, Q-ES correlated positively with a number of the measures of cognitive competence employed in this study. Therefore the fact that the cognitive abilities of the high-income children were generally superior to those of the low-income children may account for these findings.

Although in this context, the gains in social competence made by the low-income subjects can not be discussed in "compensatory" terms they were clearly large and significant. The children in both income groups became much more tactful and influential in their relationships with their peers. They also improved their problem solving and learning styles, and became more self-directed and self-controlled, more curious and persistent and more creative and imaginative.

In summary it appeared that the UWO program had been reasonably successful in achieving all of its primary goals with both the high- and the low- income children and that, for the low-income children, the program had had compensatory value in the intellectual and cognitive areas in which it was needed most.

References

Bereiter, C. & Engelmann, S. Teaching Disadvantaged Children in the Preschool. Englewood Cliffs, New Jersey: Prentice-Hall 1966.

Bereiter, C. An academic preschool for disadvantaged children: Conclusion from evaluation studies. In Julian C. Stanley (Ed.), Preschool Programs for the Disadvantaged: Five Experimental Approaches to Early Childhood Education. The Johns Hopkins University Press, Baltimore, 1972.

Bissel, J. The cognitive effects of preschool programs for disadvantaged children. In J. Frost (Ed.), Revisiting early childhood education New York: Holt, Rinehart & Winston 1973, 223-240.

Blishen, B. R. A socio-economic index for occupations in Canada. Canadian Review of Sociology and Anthropology, 1967, 4, 41-53.

Horowitz, F. D., & Paden, L. Y. The effectiveness of environmental intervention programs. In Caldwell, B. M., & Ricciuti, H. N. (Eds.) Review of Child Development Research, Vol. 3. Chicago: University of Chicago Press, 1973, pp. 331-402.

Miezitis, S. The Montessori Method: some recent research. Interchange 1971, 2(2)

Miller, L. B., & Dyer, J. L. Four preschool programs: Their dimensions and effects. Monographs of the Society for Research in Child Development 1975, 40, Nos. 5-6.

Parten, M. B. Social participation among preschool children. Journal of Abnormal & Social Psychology, 1932, 27, 243-269.

Smilansky, S. The Effects of Socio-dramatic Play on Disadvantaged Preschool Children. New York: Wiley, 1968.

Weikart, D., Rogers, L., Adcock, C. & McClelland, D. The Cognitively Oriented Curriculum: A framework for preschool teachers. Washington, D.C. National Association for the Education of Young Children, 1970.

Weikart, D. Relationships of Curriculum, teaching & learning in preschool education. In J. C. Stanley (Ed.) Preschool Programs for the Disadvantaged Baltimore: The Johns Hopkins Press, 1972, 22-66.

White, B. L., & Watts, J. C. Experience and Environment, Vol 1. Englewood Cliffs: Prentice Hall, 1973.

Wright, John C. The Kansas Reflection-Impulsivity Scale for Preschoolers. Users Manual; Cooperative Development Program, Cemrel, Inc., 3120 59th Street, St.Louis, Missouri 63139, 1971.

Wright, M. J. Recent trends in early childhood education in the U.S.A. and Canada. In Lois Brockman, Whiteley, J., & Zubek, J. (eds.), Child Development: Selected Readings. McClelland & Stewart Ltd., Toronto, 1973.

Wright, M. J. Competence in preschool children: The effects of preschool experience on the adaptive abilities of disadvantaged and advantaged children. Research Bulletin No. 313, Department of Psychology, University of Western Ontario, November 1974.

Wright, M. J. Changes in the social competence of Canadian preschool and day nursery children of low and high socio-economic status. Interchange, 1975, 6, 16-26.

Wright, M. J. Competence in preschool children II: Two years in the Laboratory Preschool. Research Bulletin No. 348, Department of Psychology, University of Western Ontario, December 1975a.

Wright, M. J. The Laboratory Preschool: Program development in the first three years Research Bulletin No. 355, Department of Psychology, University of Western Ontario, London, Canada, February 1976.

Wright, M. J. Competence in preschool children III: The second cohort. Research Bulletin No. 396. Department of Psychology, University of Western Ontario, December 1976a.

Wright, M. J., & Pederson, D. R. Situational Factors as Critical Variables in a Preschool Program. A paper presented at the annual meetings of the Canadian Psychological Association in Toronto, June, 1976.

Wright, M. J. Assessing the social competence of preschoolers aged three to six years. A paper presented at the annual meetings of the Canadian Psychological Association in Vancouver. June, 1977.

Wright, M. J. Role-taking skills and the development of social competence. A paper read at a conference on Developmental Aspects of Social Learning Theory, held during the eighth semi-annual meeting of the Ontario Laboratory Schools Association, at the Institute of Child Study, University of Toronto, Toronto. October, 1977a.