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ABSTRACT

To determine if there are discernable effects on children of a group child-care program, the performance of 20 children, 3 to 4 years 10 months of age, who had been cared for in a day-care center from the age of 6 months is compared with that of 20 matched children with no prior day-care program experience. The 40 children participated in activities carried on in three program areas--an active area, an expressive area, and a task-oriented area. For an 8-months period, observations were obtained on all children on a point-time sampling basis; that is, during a set period of one minute, the observer noted the children's behavior in regard to (1) children's choice of locations in the program setting, (2) interaction with peers, and (3) interactions with adults. An analysis of variance was performed on the data. The findings of the study showed that (1) there were significant differences between children with prior child-care experience and those with no prior experience: children with prior experience were located in the active area more frequently; prior-experience children were located in the expressive area and in the task area less frequently; there was more verbal interaction with a peer by the prior-experience children and they also showed more positive peer interaction; (2) there were no significant differences between the two groups in regard to time spent in snack, invitational, or outdoor play areas; in gestural or tactile interaction; and in any dimension of adult interaction; and (3) there were sex differences on time spent in active and expressive areas and as recipients of social interaction. It is concluded that the stimulating early day-care programs had significant impact on the childrens' functioning and preferences. Tables and figures present the data. (DJ)

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Effects of Early Day Care Experience on Subsequent Observed Program Behaviors

Margaret Z. Lay and William J. Meyer

There is currently a general acceptance of the idea that positive outcomes would accrue for many "disadvantaged" children from participation from an early age in stimulating group day care programs. There is a similar acceptance among many professionals of the desirability of any young child being cared for in a "good" day care center rather than primarily remaining in a family care setting.

There is actually very little documentation, however, of whether the characteristics of children cared for in the home setting during the first three years differ from those of children who have been enrolled in a group day care setting. Those reports which are available (Freud and Dann, 1951, Spiro, 1965; Bettelheim, 1969) consider children's development in group care situations which have been created in settings far different from the current American milieu. The question which needs addressing in our situation is whether there are discernible effects on children of being taken from their home for extended periods of time during the day to be cared for in a group child care program. The present study which addresses this question was the result of a unique opportunity to work with 20 children who had previously been in a day care setting from the age of approximately six months.

The 20 children had been previously at the Children's Center of Syracuse University under the direction of Dr. Bettye Caldwell. This program, described in detail elsewhere, (Caldwell and Richmond, 1964; 1968; Caldwell, 1970) was established to provide maximal educational, medical, and social services to children beginning at six months of age. Sensory and cognitive

stimulation was provided to the children using procedures and materials commensurate with their developmental level. When Dr. Ronald Lally assumed the Directorship of the Children's Center in September, 1969, he wanted to continue the preschool program (age three through five) but preferably in another setting, permitting him to concentrate his efforts on the babies and toddlers. At the same time the senior author of this report was launching plans for an "open environment" program for threes and fours which was deemed highly appropriate for day care. It became clear that through cooperative effort it would be possible to continue day care services for the Children's Center youngsters in this program. It was also eventually determined that the research planned for the new center would become one of the programs at Syracuse University to be supported by HFECE. As a result of this series of arrangements the 20 Children's Center youngsters were transferred to the Syracuse University Early Childhood Education Center - SUECEC day care program in September, 1970 and, to allow a comparison study, it was decided to also enroll an additional 20 children with no prior program experience.

The SUECEC day care program provides a set of circumstances designed to facilitate child autonomy in using diverse kinds of materials and to encourage social interaction between children. The program also provides for maximal adult input and extensive experiences calculated to furnish a rich educational milieu.

The 40 children enrolled at SUECEC in September, 1970, were placed in one large group--in contrast to being sub-divided into smaller groups of 15 to 20 as is the more typical arrangement. The adult-child ratio was maintained at approximately 1 to 7. A total program space of 6000 square feet

was made available for use and the differentiated arrangement of this space was a central feature of the program design. For most of the program day (7:30 A.M. to 5:30 P.M.) all children in attendance had open access to these program areas--an active area, an expressive area, and a task-oriented area. Each area provided for a specific type of participation with differing expectations for children's behavior. The physical arrangement of these areas is depicted in Figure 1.

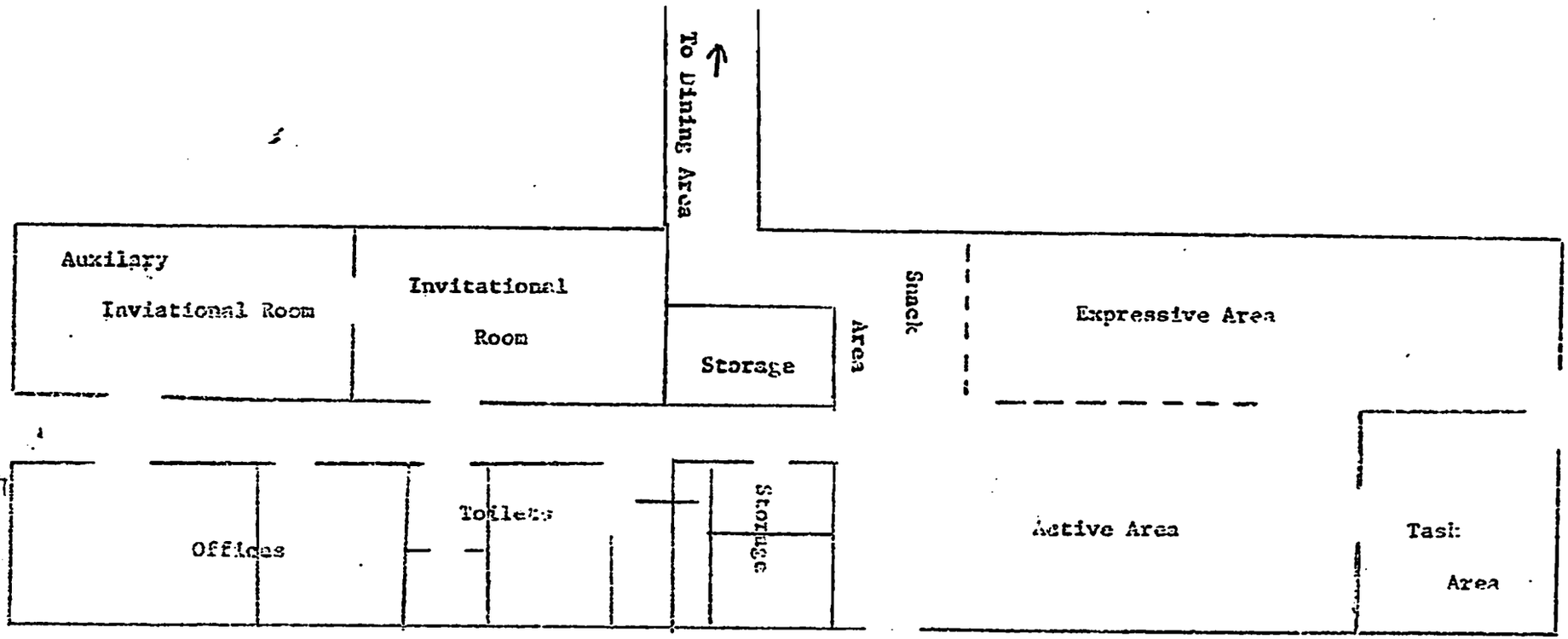
The active area was designed to encourage large muscle activity. The equipment provided included a jungle gym, rocking boats, tunnel, mat, push cart, steering toy, ride toys, walking board, wheel barrow, climb rope, large blocks, unit blocks, toy people and animals, toy cars and trucks, etc. Few restrictions were placed on children's "doing" in this area. Running, shouting, teasing, etc. were acceptable in this space.

The expressive area was arranged to facilitate creative expression and dramatic play. The equipment and materials provided included easels, work bench, tables, chairs, art media, record player, musical instruments, mirror, puppets, housekeeping furniture (stove, cupboard, doll bed, etc.) toy telephones, dishes, suitcases. Children were expected to walk - not run - in this area and to contain art media to certain specified locations.

The task-oriented area provided tables, chairs, shelving with many manipulative materials (both convergent and divergent). Included in this collection were books of all kinds, listening station, Language Master, alphabet form board, puzzles, color forms, cylinders and discs, stencils, paper, pencils, felt pens, etc. The ground rules for use of this area included an expectation of sedentary involvement and the expectation that each individual return any material he used to the shelves after use.

Figure 1

Physical Arrangement of Space



Children were also regularly invited to participate in certain "invitational" events which included snack, story, music activities, outdoor play, cooking activities, field trips. These were available to all children at certain periods of time but were typically not mandatory for any child. The situation provided for the child a very rich set of circumstances to which he had the same kind of informal access typical of a "friendly neighborhood".

The 20 Children's Center youngsters (hereafter designated as CC) were introduced into this program for the first time in October, 1970, as were the 20 selected as a comparison group (hereafter designated as Non-CC). For the Non-CC Ss this was a first experience in any type of program setting. The CC Ss had, on the other hand, been day care program participants together in the same group since infancy. The specific program they had encountered just prior to leaving the Children's Center is described by Lally et al. (1970) as transitional from a traditional type nursery school of homogeneous age groupings to a multi-age arrangement with increased individual options for location and selection of activity. Therefore, although most of the CC Ss had been in a highly structured group setting as toddlers they had some exposure to a more open setting toward the later portion of their Children's Center experience.

Upon entering the SUECEC program, both groups -- CC and Non-CC Ss, encountered the same environment, the same options, and the same expectations. The choices and behaviors in this new setting were observed and recorded across the 1970-71 program year and used as the dependent measures analyzed for the present report.

A prior report (Lally, Lindstrom, Meyer and Lay, 1971) on the comparison of intellectual characteristics of the two groups found few significant

differences on the sub-scales of the ITPA and no significant differences on Stanford-Binet scores. It was suggested in that document that difficulties inherent in providing matches ex post facto might account for the absence of evidence of the superiority which might have been expected for stimulation group (CC Ss). With one exception, the matches were considered generally satisfactory on gross variables of sex, race, age, parent occupation, and parent education. Doubt was expressed, however, as to whether the matches selected in September, 1970 came from homes reflecting the same degree of disorganization as the CC group. These issues will be reexamined in this report as they have relevance to interpreting the findings of the present study.

A basic question being addressed is whether behavioral data will reflect differences between children receiving early care in stimulating group situations and children who have not been previously associated with day care programs. It was anticipated that behavioral data would reflect whatever differences do exist whereas test data might not. The extent to which this is the case is the focus of this report. The aspects of behavior examined include (1) children's choice of locations in the program setting, (2) interaction with peers, and (3) interactions with adults.

Method

Sample

The CC group of 20 children was composed of children from low- and middle-income homes. Their ages ranged from 3 years to 4 years and 10 months upon transfer to the SUECEC program in October 1970. They had an average of 37.4 months (S.D. = 10.21) in prior day care. Nineteen of these children were matched to a Non-CC child on the following criteria: age, sex, race, education and occupation level of parents. In addition to the 19 matched pairs, data for the unmatched CC child (white male) and Non-CC child (black female) are included in the analyses conducted for this study. A summary of the characteristics of the CC group and the Non-CC group are contained in Table 1.

As we pointed out in the previous study on intellectual characteristics (Lally, et al, 1971), the CC group were, in some cases, from very disorganized home situations. In fact, several had been transferred from a longitudinal control group to become recipients of day care service because CC staff observations on the children and their families indicated an urgent need for day care. This was as true for some of the middle income CC families as of the low income group. Although degree of need for day care was not a prime consideration for the selection of the matches, it was later learned that family disorganization did exist in some of these instances as well. However, the extent to which the CC group are from qualitatively different home circumstances is not easily determinable and there is certainly no means of answering the more potent question of whether their situations were significantly different during the first three or four years of life.

Table 1

SUMMARY OF BACKGROUND CHARACTERISTICS OF CC AND NON-CC CHILDREN

	CC	Non-CC
Race		
Black	12	12
White	8	8
Sex		
Male	9	8
Female	11	12
Family Situation		
Intact home	9	12
Father not in home	7	7
Living with other than own parent(s)	2	1
Adopted as infant - Intact Home	2	0
Father's Occupation		
Professional	1	1
Technical	2	-
Skilled	1	1
Semi-skilled	7	6
Unskilled	0	4
Mother's Occupation		
Professional	5	1
Technical	1	0
Skilled	2	5
Semi-skilled	4	3
Unskilled	4	5
Housewife	4	3
Student (tech, or bus. school)	0	3
Father's Education		
9th or less	3	2
10 - 11th	3	4
H.S.	2	5
Some College	3	0
B.A. Degree	0	0
Some graduate work	1	1

Table 1 (cont.)

Mother's Education		
9th or less	3	1
10 - 11th	6	1
H.S.	2	11
Some College	5	6
B.A. degree	3	1
Some Graduate Work	1	0

Observational procedures

For an eight-month period from October, 1970 through May, 1971, observations of all 40 children enrolled in the SUECEC program were obtained on a point - time sampling basis, that is, during a set period of one minute the observer noted whether any of a selected set of events or encounters occurred. For those which did occur notation was made. Observation, as used in this report, refers to the notations made by a trained observer--after he has focused on an individual child for a one minute period--of which of a given set of pre-specified events or encounters occurred for that child at any point during that minute. The recording was done on a binary basis and, thus, multiple occurences of any event throughout the minute are not discriminated in the notation. For each observation a record was produced of which of a multiple set of events occurred (but not how often any occurred within the minute).

The names of the 40 children enrolled in the SUECEC program were randomly arranged into eight blocks of five subjects each and during a given observation session (usually of two or three hours duration) a trained observer was assigned a block of five names and a second block of five alternative names. Upon entering the program setting the observer determined whether the five subjects in the assigned block were in attendance. If so he disregarded the second block. If not, he replaced those absent with the alternative names. If the original subjects arrived later the alternatives were dropped and the arriving subjects included.

The observer then focused on each of the subjects from the assigned blocks in turn. That is, he located the first listed subject in the program setting and immediately observed him for a continuous one-minute period. At the end of one minute he made the pertinent recordings on a special form.

He then located the second subject, observed one minute, made pertinent recordings, located third subject, etc. He rotated through the block of names in each rotation.

A maximum of eight observations per subject per session were made. Each subject was observed for approximately 30 separate one-minute observations during a two to three week period each month. A mean of 230 minutes of sampled observations were collected per child for the program and 9238 minutes across children in the SUECEC setting.

The assumption, of course, in this method of data collection was that by sampling on a random basis across different days, weeks, and months the frequencies obtained are adequately representative of the frequencies which would be found if all minutes within the time spans were considered. The frequencies referred to throughout this report have been calculated in terms of proportion of the total number of observations in which the given specified event occurred.

Observers. Ten persons participated as observers and most of the data were collected by seven of this group. All were advanced undergraduate or graduate students in developmental psychology or education. Some were involved in the initial development and refinement of the observation codes. All received instruction and had series of practice sessions prior to formal data collection.

Reliability. Preliminary analyses of reliability were done on child observations using 32 sets of simultaneous observations obtained by eight pairs of observers during October and November. Percentage of agreement was determined for each of the individual items on the initial form and the range was from 71.9 to 100. Those items in the seventies were eliminated in subsequent revisions and none included the present report and the percentage of

agreement on all retained items were from 81.3 to 100 with most falling in the nineties range.

Data Processing. A code was devised prior to the November 1970 data collection for which the observer could utilize Optical Scanning Forms as the recording sheet. Each observation thus was processed with scanning equipment available at the Syracuse University Psychological Services Center. The scanning procedure produced a punched data card which retained all of the data in a form in which they were available for various kinds of analysis. The initial set of codes used to collect data in October, November, December, and January is included in Appendix A. Revised forms, used in February, March, April and May, provided elaborations of the initial codes and a rearrangement designed to facilitate the recording process. Data included in this report are, however, all reported in the initial categories to facilitate interpretations. Combinations of categories on the revised form were designed to be comparable to certain categories on the initial ones.

Only portions of the total data collected provided relevant information for CC and Non-CC comparisons. Remaining portions will furnish descriptive material for the SUECEC Program Manual currently in preparation. The data to be considered in this report include only (1) children's location in the program setting; (2) interactions with peers, (3) interactions with adults.

All frequency counts were transformed to proportions prior to examination of the data. All tables of means and variances within this report represent calculations made on the percentage of total observations for individual children in which specific events were observed to occur. Means and variance were determined across seven months (November through May) of

observation and separately in two month time blocks of October-November, December-January, February-March, April-May. It will be noted that data on some variables were derived for only a portion of the eight month period. The analyses presented in this report were based on either seven-month totals or specified two-month totals. In each separate instance tables and text will specify the particular totals included in the analysis. The total number of observations being referred to for each of the time periods is presented in Table 2.

For each of the variables presented in the following sections a 2 x 2 analysis of variance which examines effect of prior experience and sex differences will be presented. Prior experience refers to experience in day care program, i.e. CC group, vs. no previous program experience, i.e. Non-CC group.

Table 2

NUMBER OF OBSERVATIONS INCLUDED IN TWO-MONTH

AND SEVEN OR EIGHT MONTH TOTALS

Oct-Nov	2098
Dec-Jan	2348
Feb-Mar	2424
Apr-May	2368
7-Month Total* Nov-May	8264

*It will be noted that the final total excludes October data and includes only November through May. The optical scanning forms were not used until November and therefore October data was hand tallied. The October data is included, as the heading indicates, in the first time block of October-November but is not included in the final totals.

Results

Location in Program Setting

During the entire daily period of time in which observations were done, as well as much of the remainder of the program day, the 40 children had access to the three base program areas previously described and designated in Figure 1 as Active, Expressive, Task. For more limited periods of time the children were also typically invited to go to other locations for special events. Snack was available for 45 minutes to an hour twice each day; activities such as group story, music, dramatics, films, etc. were available for approximately 30 to 45 minutes in the special "invitational" rooms and children had the option of going outdoors anytime during a 45 minute to an hour period whenever the weather permitted.

The proportion of total observations in which individual children were observed to be in each of the program areas was determined for each of the four two-month observation periods. The group mean for these proportions are presented in Table 3.

In the following sections the data on each of the locations will be further examined. Means of each of the sub-groups are presented and the results of the analysis of variance examining experience and sex differences considered.

Location in active area. The means of proportions for each of the sub-groups (CC boys, CC girls, Non-CC boys, Non-CC girls) for each of the four observations periods are graphically presented in Figure 2 and the data in Table 4. It will be noted that for both the CC and Non-CC groups boys' proportions are higher with the exception of February-March in which CC girls' proportions slightly exceeded boys. Non-CC boys and girls spent more time in the active areas initially than their CC counter parts but stabilized

Table 3

MEANS AND STANDARD DEVIATIONS ON LOCATION

IN EACH OF SIX AREAS FOR TOTAL GROUP

	Oct.-Nov		Dec-Jan		Feb-March		April-May		7 Mo. Total	
	M	SD	M	SD	M	SD	M	SD	M	SD
ACTIVE	33.0	9.9	34.3	12.5	39.9	14.1	33.6	11.1	35.7	9.1
EXPRESSIVE	20.4	10.0	21.3	7.8	15.2	8.1	15.7	6.6	18.2	5.6
TASK	13.0	8.6	12.1	8.7	12.7	9.2	9.0	8.9	11.2	6.2
SNACK	12.3	7.0	12.6	7.0	8.8	5.5	8.0	5.8	10.2	4.7
INVITATIONAL	3.9	5.2	5.4	3.3	8.9	6.3	11.6	6.6	8.2	2.7
OUTDOORS	7.3	6.4	4.8	4.3	5.6	5.6	19.8	7.0	10.4	4.1

Table 4

LOCATION IN ACTIVE AREA FOR FIVE

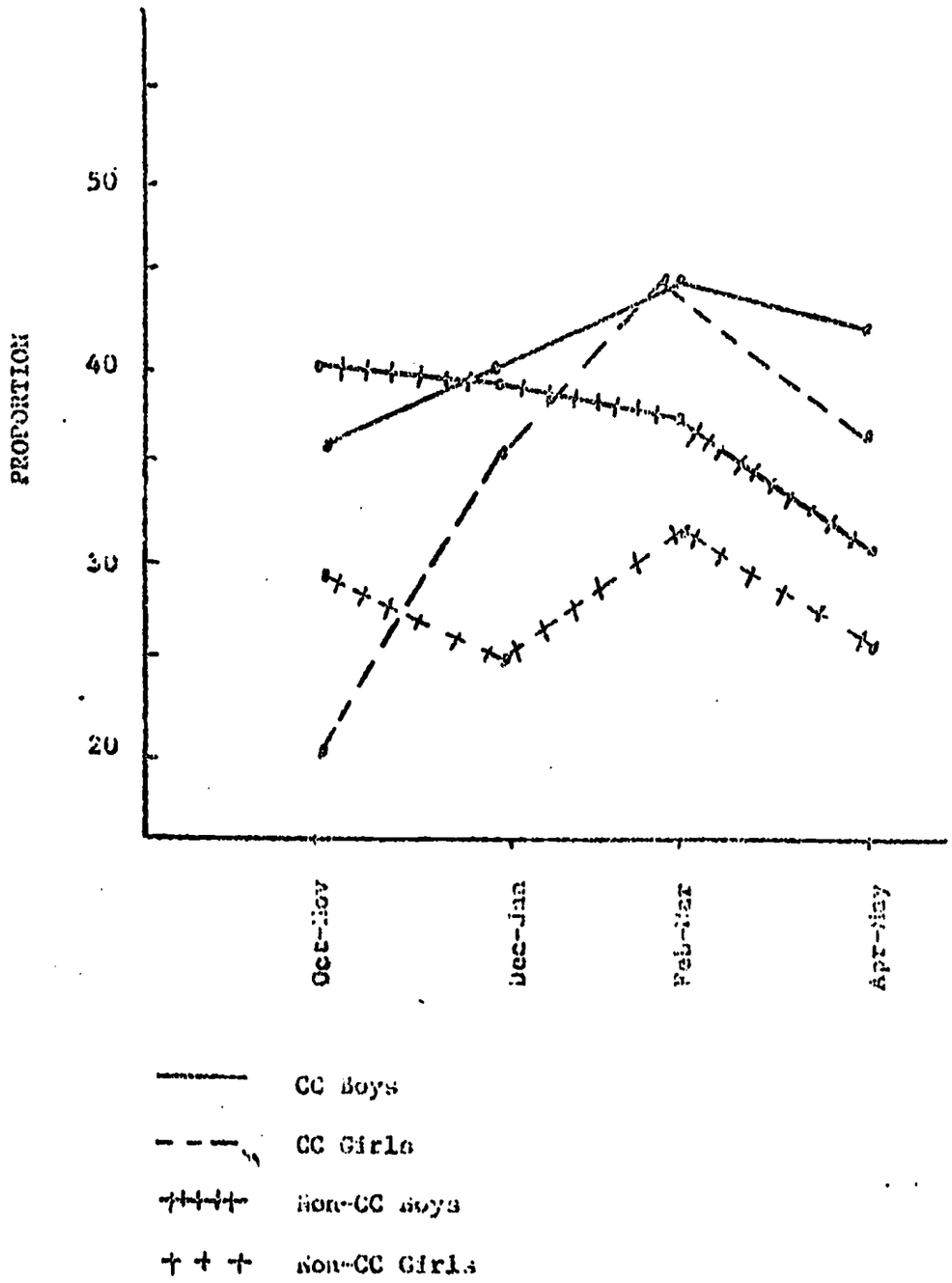
TIME BLOCKS BY SUB-GROUPS AND TOTAL GROUPS

		Oct-Nov	Dec-Jan	Feb-Mar	Apr-May	7-Month Nov-May Total
CC	Boys	36.9	41.8	45.1	43.1	43.0
	Girls	20.0	35.0	46.0	35.9	37.5
Non-CC	Boys	40.9	39.9	37.0	30.1	36.6
	Girls	29.5	24.3	32.4	26.8	28.1
Total Group	M	33.6	34.3	39.9	33.6	35.7
	S.D.	9.9	12.5	14.1	11.1	9.1

Figure 2

LOCATION IN ACTIVE AREA FOR

FOUR TIME PERIODS BY SUB-GROUPS



into lower frequency of location there during the latter time blocks.

Analysis of variance on the proportions determined for the seven month period, November through May, are presented in Table 5. Significant differences are reported for previous day care experience as well as sex. The means for each of the sub-groups for the seven-month periods were 43.0% for CC boys, 37.5% for CC girls, 36.6% for Non-CC boys, and only 28.1% for Non-CC girls.

Location in Expressive area. Data on proportion of observations in which children were located in the expressive area are presented in Table 6 and Figure 3. Non-CC boys showed a very erratic pattern across the year in contrast to the other three subgroups. (The dip in proportions in February-March reflect to some extent an unusual situation existing in that location during that period due to building renovations which curtailed availability of the area to some extent. Otherwise, it would be anticipated that there would have been no particular drop (due to external circumstances) during that period whereas a drop in April-May would be expected due to children's preference for outdoor play during mild weather.

The results of the analysis of variance performed on the seven-month total of November-May data are presented in Table 7. Significant effects were found for both sex and prior experience. Examination of the means shows boys in the expressive area in 15.4% of the observations and girls, 20.2%. CC Ss were in the expressive area for 15.6% of observations and Non-CC for 20.1%.

Location in the Task area. The compilation of data on proportion of observations in which children were located in the task area are presented in Table 8 and Figure 4. It will be noted that, as was the case with the expressive area data, the Non-CC boys' frequencies appear to rather markedly contrast

Table 5

ANALYSIS OF VARIANCE OF LOCATION IN

THE ACTIVE AREA FOR PRIOR EXPERIENCE AND SEX

Source	df	MS	F	p
Experience	1	.061	10.45	.005
Sex	1	.047	8.04	.01
Interaction	1	.002	.37	
Within	36			

Table 6

LOCATION IN EXPRESSIVE AREA FOR FIVE

TIME BLOCKS BY SUB-GROUPS AND TOTAL GROUP

	Oct-Nov	Dec-Jan	Feb-Mar	Apr-May	7-Month Total Nov-May
CC-Boys	18.1	16.9	9.9	10.[illegible]	13.2
CC-Girls	22.0	20.7	12.7	15.[illegible]	17.9
Non-CC Boys	17.0	23.0	17.8	12.[illegible]	17.6
Non-CC Girls	22.8	24.0	19.7	21.7	22.5
Total					
M	20.4	21.3	15.2	14.[illegible]	18.2
S.D.	10.0	7.8	8.1	6.[illegible]	5.6

Figure 3

LOCATION IN EXPRESSIVE AREA

FOR FOUR TIME PERIODS BY SUB-GROUPS

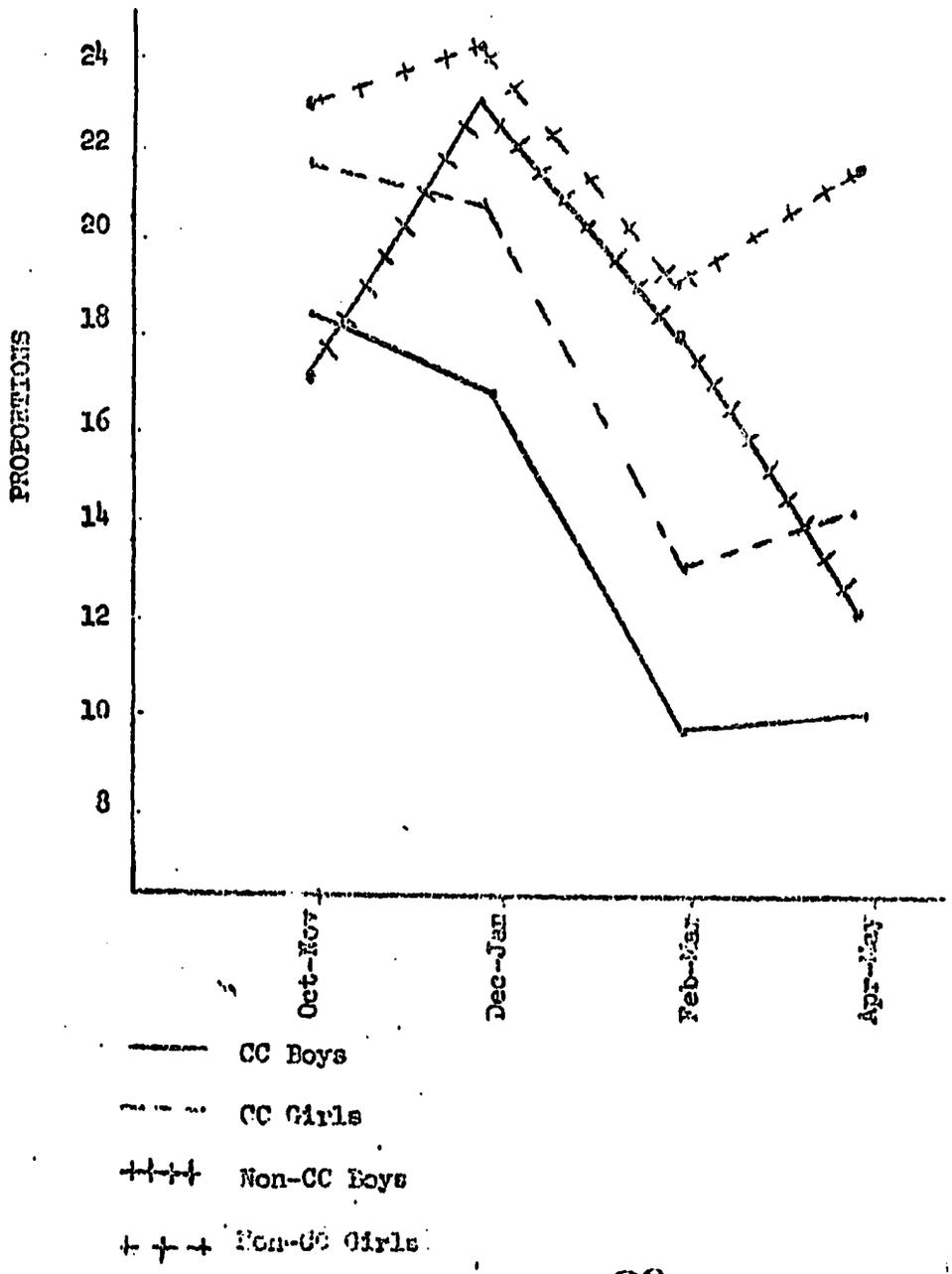


Table 7

ANALYSIS OF VARIANCE ON LOCATION IN EXPRESSIVE AREA FOR PRIOR EXPERIENCE AND SEX

Source	df	MS	F	p
Experience	1	.020	8.82	.005
Sex	1	.023	10.17	.005
Interaction	1	.000	.00	
Within	36	.002		

Table 8

LOCATION IN TASK AREA FOR FIVE

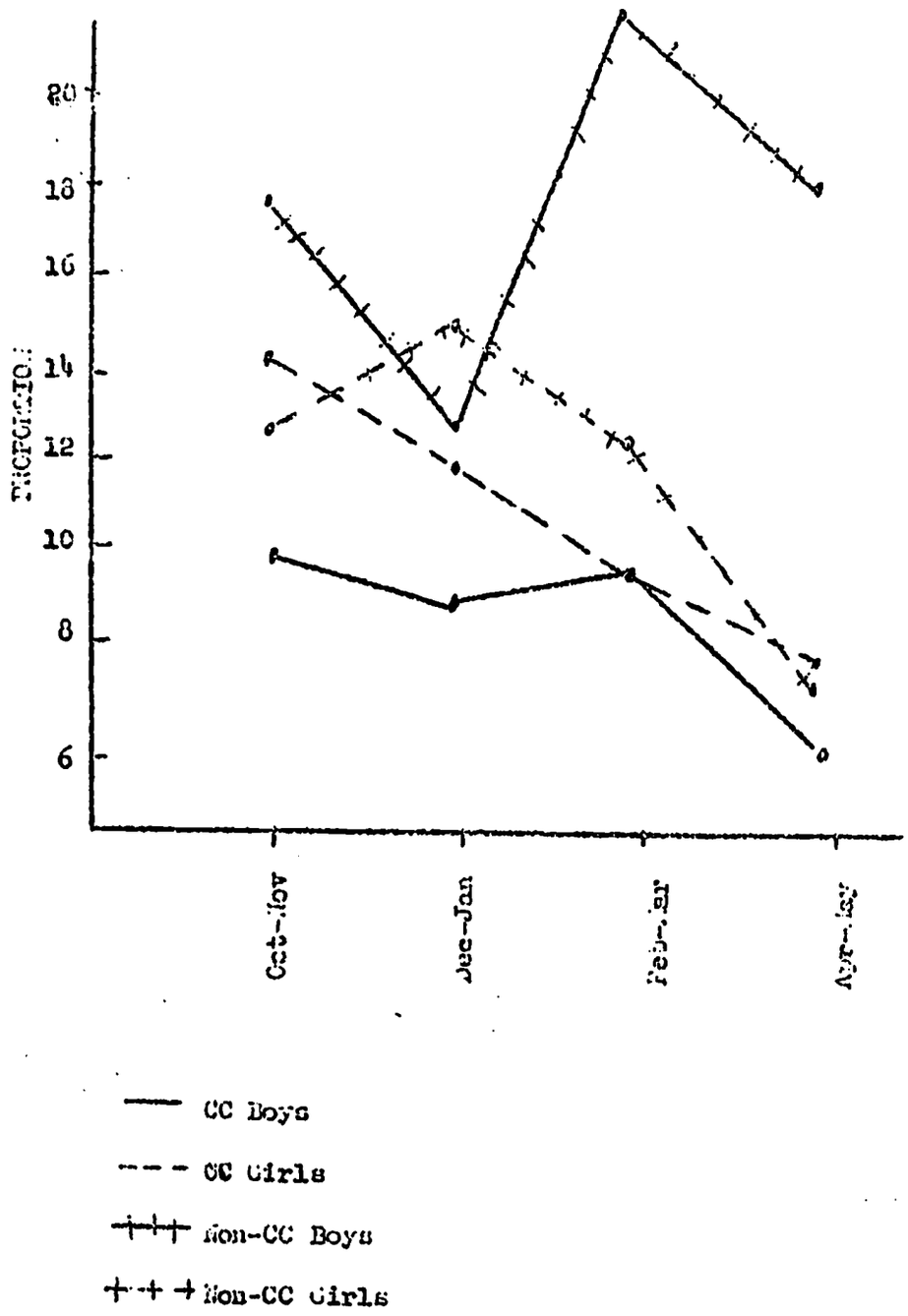
TIME BLOCKS BY SUB-GROUPS AND TOTAL GROUP

	Oct-Nov	Dec-Jan	Feb-Mar	Apr-May	7-Month Total Nov-May
CC Boys	9.9	9.0	9.6	5.9	7.9
CC Girls	14.1	12.0	9.6	7.7	10.0
Non-CC Boys	16.7	12.6	21.8	16.8	16.5
Non-CC Girls	12.0	14.3	12.0	7.1	11.5
Total M.	13.0	12.1	12.7	9.0	11.2
S.D.	8.6	8.7	9.2	8.9	6.2

Figure 4

LOCATION IN TASK AREA BY

FOUR SUB-GROUPS FOR FOUR TIME PERIODS



with the other groups. In the latter part of the year their proportions for location in the task area far exceed those of the other groups.

The analysis of variance results are summarized in Table 9. No sex differences were found but there were significant effects from prior day care experience. The means for the CC Ss was 8.9% while Non-CC Ss were located in the task area for 14.0% of their observations.

Location in Snack area. Although the snack area was only open to children at specified periods during the day, it was equally accessible to all Ss. Analysis of variance found neither sex nor prior experience differences no interaction effects in the proportion of time children were observed to be in the snack location. The means for the seven-month November-May period for each of the sub-groups were as follows: CC boys, 8.7%; CC girls, 10.5%; Non-CC boys, 8.6%; Non-CC girls, 12.0%.

Location in invitational room. There were no significant effects of either sex or prior experience or interactions on the proportion of observations in which children were located in the invitational room for story, music, dramatic events, etc. The means for sub-groups for the November through May period were CC boys, 9.1%; CC girls, 8.7%; Non-CC boys, 7.0%; and Non-CC girls, 7.8%.

Location in Outdoor areas. No significant differences were found according to sex or experience and there no interaction effects on proportion of observations in which children were located out-of-doors. The means for the sub-groups for the November-May observations were as follows: CC boys, 13.0%; CC girls, 9.7%; Non-CC boys, 9.4%; Non-CC girls, 9.8%.

Summary of location findings. Significant differences were found between CC and Non-CC Ss in proportion of total observations in which they were located in the active, expressive, and task areas CC Ss

Table 9

ANALYSIS OF VARIANCE ON LOCATION IN TASK

AREA FOR PRIOR EXPERIENCE AND SEX

Source	df	MS	F	p
Experience	1	.025	7.36	.01
Sex	1	.002	.62	
Interaction	1	.012	3.61	
Within	36	.003		

has higher proportions in the active area and lower in the expressive and task area.

These data are reflecting, of course, children's preferences for activity and to a great extent these frequencies are contingent--that is, to have higher proportions in one area less time must be spent in other areas.

CC Ss clearly seem to prefer the active area in which there was open space and larger-muscle equipment but very little provision for involvement with other kinds of materials or tasks. They had correspondingly lower frequencies on the expressive and task areas which were significantly different from Non-CC children. There were not, however, differences in frequency of time spent in snack or in more organized group activities in the invitational room or in outdoor play.

Sex differences were found on two of the locations. Boys had significantly higher proportions in the active area and significantly less in the expressive.

Interactions with peers

For each minute constituting an observation a record was made of (a) whether the target child was involved in a verbal interaction with a peer, (b) whether the target child was involved in a gestural interaction with a peer, (c) whether the target child had tactile contact with a peer, (d) whether the interaction was all positive or included negative action on the part of the target child (e) which peers were the recipients of interaction.

Verbal interaction with peers. As evidenced in Table 10 and Figure 5 the mean proportion of verbal interaction substantially increased across the year for all sub-groups. The percentage of observations in which CC boys and girls were observed to have verbal interaction with peers increased

Table 10

FREQUENCY OF VERBAL INTERACTION WITH PEERS FOR FIVE

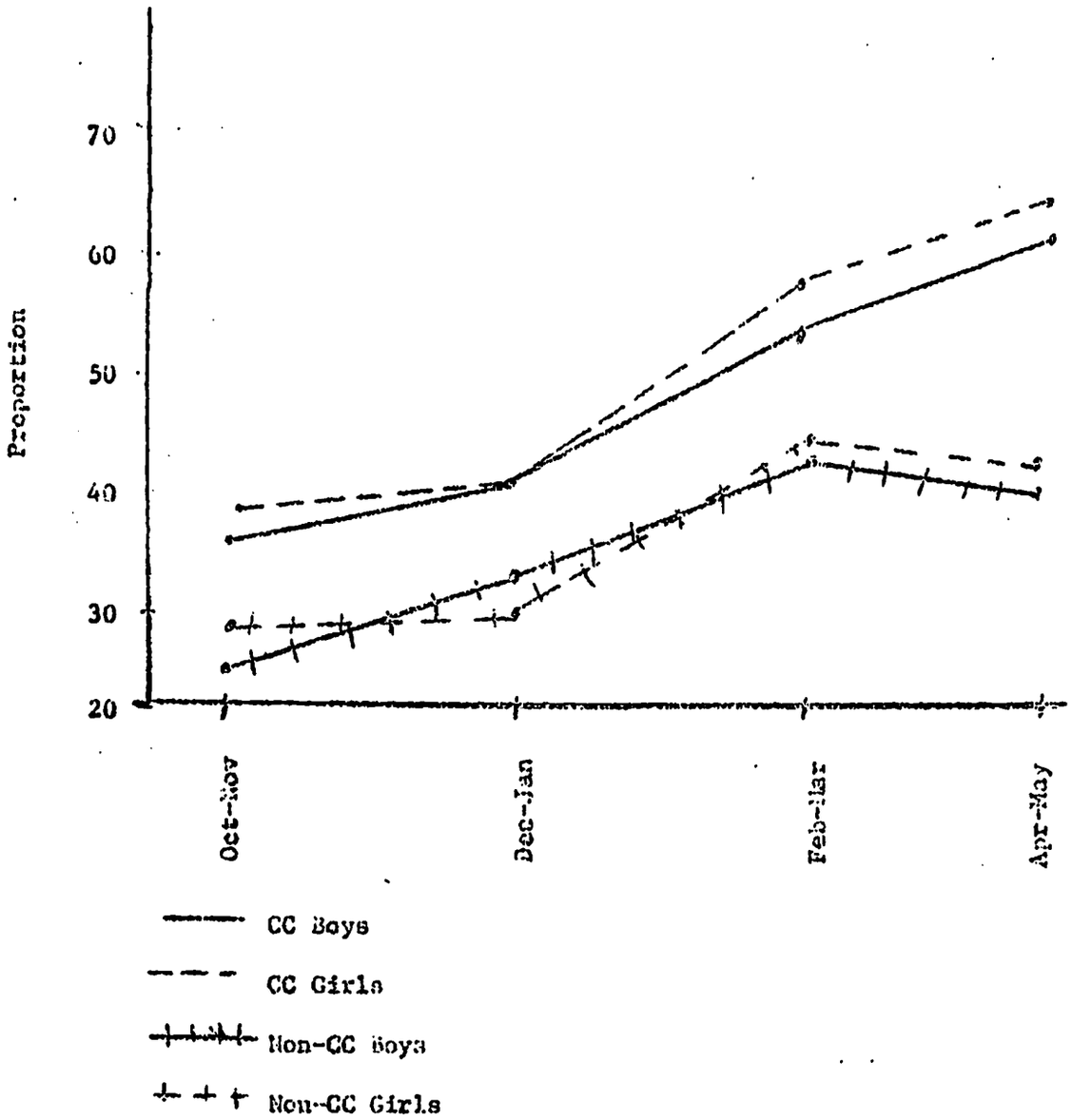
TIME BLOCKS BY SUB-GROUPS AND TOTAL GROUP

	Oct-Nov	Dec-Jan	Feb-Mar	Apr-May	Nov-May Total
MC Boys	36.5	43.0	54.1	61.8	51.5
Girls	38.9	42.8	52.9	60.0	51.0
SUECEC Boys	26.4	34.1	43.4	41.9	38.4
Girls	29.1	30.5	44.4	43.0	39.0
Total Group M	32.9	37.4	48.7	51.7	44.9
S.D.	14.3	13.7	14.9	16.4	13.0

Figure 5

FREQUENCY OF VERBAL INTERACTION WITH PEERS FOR

FOUR TIME BLOCKS BY SUB-GROUPS



25.3% and 21.1% respectively between the first observation period and the last. Increases for Non-CC Ss were also substantial although somewhat less--15.5% for boys and 13.9% for girls. The mean for all children for the November-May observational period was 44.9% (S.D. = 13.0) which reflects the highly active social context of the SUECEC program.

The results of the analysis of variance performed on the November through May data are summarized in Table 11. It was found that there were experience differences in the incidence of verbal interaction in which the CC Ss had a mean of 52.1% and the Non-CC group, 39.7%. Further analysis of each of the successive two month observational periods found these differences to be persistent with an F of 4.84 ($p < .05$, df 1/36) in October-November, and F of 6.33 ($p < .05$, df 1/36) in December-January, and F of 4.01 ($p < .05$, df 1/36) in February-March, and by April-May the F was 16.12 ($p < .001$, df 1/36).[1] Significant differences by sex or interactions were not found for any of the four time blocks.

Gestural interaction with peers. Any bodily gesture or facial grimace occurring during the minute observation period was recorded as gestural interaction. The means for October through January data are presented in Table 12. This kind of data were not derived for the remaining observation periods.

Analysis of variance found no significant differences according to sex or previous experience for either time block.

Tactile contact with peers. If the target child touched or was touched by another child during the minute observation the category of tactile contact was marked. The data collected in the October through

[1] The results of these analyses suggest that a trends analyses is required which will more clearly define the interaction of sex difference and experience differences over time.

Table 11

ANALYSIS OF VARIANCE ON VERBAL INTERACTION

WITH PEERS FOR PRIOR EXPERIENCE AND SEX

Source	df	MS	F	p
Experience	1	.149	10.37	.005
Sex	1	.001	.00	
Interaction	1	.006	.03	
Within	36	.015		

Table 12

GESTURAL INTERACTION WITH PEERS FOR

TWO TIME BLOCKS BY SUB-GROUPS AND TOTAL GROUP

	Oct-Nov	Dec-Jan
CC		
Boys	13.4	26.0
Girls	15.0	23.6
Non-CC		
Boys	15.4	23.4
Girls	14.2	19.0
Total Group		
M	14.5	22.8
S.D.	7.0	8.6

January observational periods are summarized in Table 13. Data for February through May were not derived for this variable. The analysis of variance found no effects for either experience or sex for either time block.

Positive/negative peer interactions. Recording was also done by the observer of those instances in which, during the minute observation, some interaction (either verbal, gestural, or tactile) occurred and in which all of the interaction was judged to be positive in nature. Notation was also made in another category of the recording sheet of those observations in which negative actions were taken by the target child toward a peer. Data on these variables were not collected in the month of October but were obtained for November through May. Although the observation form used in February through May provided a slightly different format for recording, corresponding summarizations were derivable. The data were summarized in Tables 14 and 15 and presented graphically in Figures 6 and 7.

Both the CC girls and boys increased steadily in proportion of positive interaction noted throughout the year. As evidenced in Figure 7 these two sub-groups were at essentially the same point in November and progressed similarly thereafter. Although Non-CC girls began at the same approximate point and increased correspondingly through March, their total proportion of positive interactions plateaued from that point. Non-CC boys had little increase until February-March and then a slight decrease.

The results of analysis of variance for the seven-month total of observations on positive interaction with peers are presented in Table 16. There were significant effects from previous day care experience. Examination of the means finds CC Ss higher (M = 50.3%) in percentage of observations in

Table 13

TACTILE CONTACT WITH PEERS FOR TWO

TIME BLOCKS BY SUB-GROUPS AND TOTAL GROUP

	Oct-Nov	Dec-Jan
CC		
Boys	.182	.199
Girls	.198	.229
Non-CC		
Boys	.148	.199
Girls	.132	.152
Total Group		
M	.165	.194
S.D.	.085	.072

Table 14

POSITIVE INTERACTION WITH PEERS

FOR FOUR TIME BLOCKS BY SUB-GROUPS AND TOTAL GROUP

		Nov*	Dec-Jan	Feb-Mar	Apr-May	Total
CC						
	Boys	31.4	41.1	52.8	62.9	49.6
	Girls	34.2	39.3	55.6	62.7	50.3
Non-CC						
	Boys	30.1	41.2	49.4	49.2	44.8
	Girls	28.2	29.5	44.0	41.4	36.8
Total						
	M	31.0	37.2	50.3	53.7	45.0
	S.D.	13.6	12.9	13.7	15.8	11.6

*1124 observations were collected in this time period for all Ss.

Figure 6

POSITIVE INTERACTIONS WITH PEERS

FOR FOUR TIME BLOCKS BY SUB-GROUPS

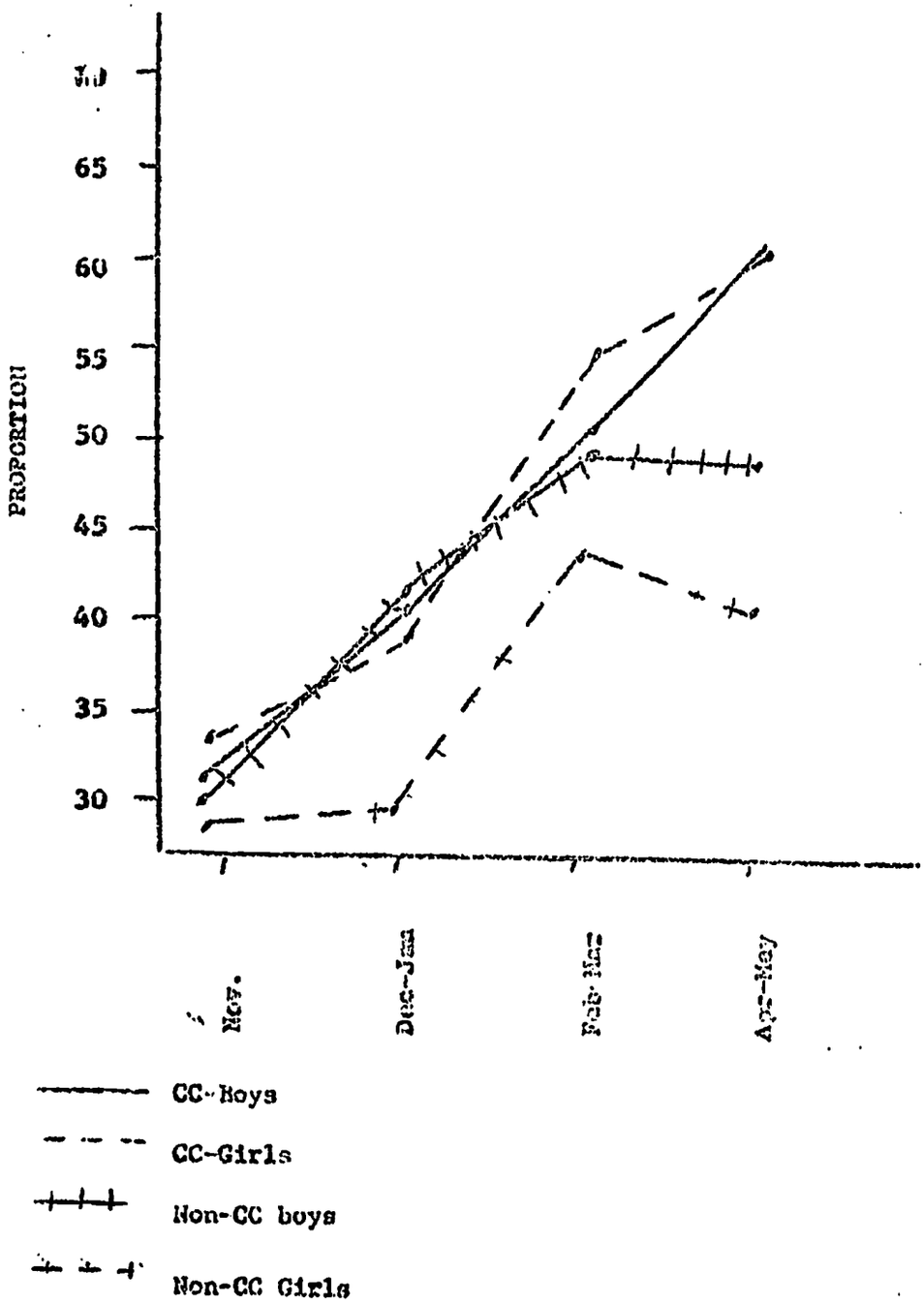


Table 15

FREQUENCY OF NEGATIVE ACTIONS BY OBSERVED CHILD TO PEER FOR FOUR TIME BLOCKS BY SUB-GROUPS AND TOTAL GROUP

		Nov*	Dec-Jan	Feb-Mar	Apr-May	Total
CC						
	Boys	.090	.074	.051	.038	.059
	Girls	.081	.063	.025	.025	.042
Non-CC						
	Boys	.028	.081	.038	.048	.050
	Girls	.064	.050	.028	.029	.039
Total						
	M	.067	.065	.034	.033	.046
	S.D.	.054	.043	.027	.031	.026

*1124 observations were collected in this time period for all Ss.

Figure 7

NEGATIVE ACTIONS BY OBSERVED CHILD TO PEER FOR

FOUR TIME BLOCKS BY SUB-GROUPS

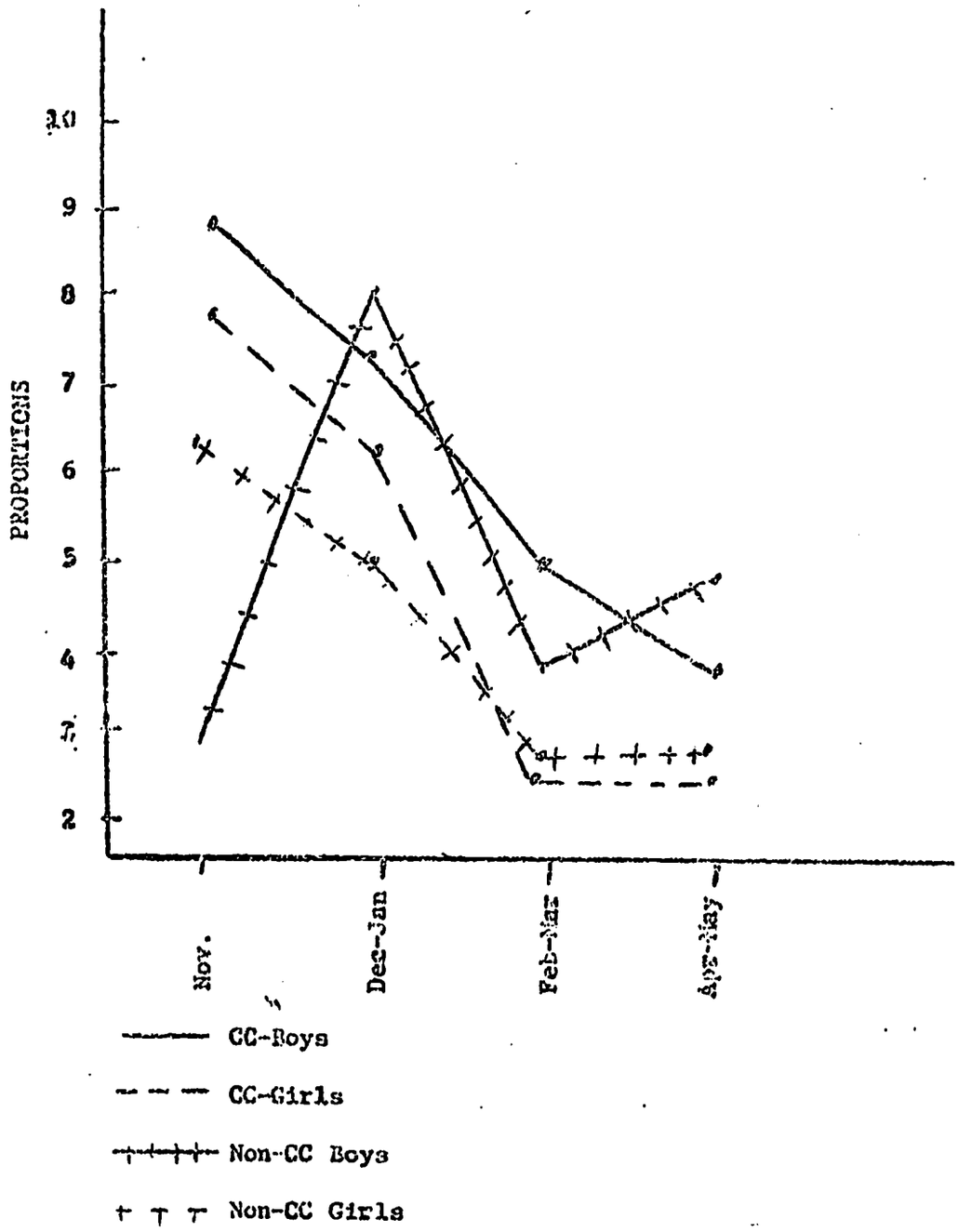


Table 16

ANALYSIS OF VARIANCE ON POSITIVE INTERACTION

WITH PEERS FOR PRIOR EXPERIENCE AND SEX

Source	df	MS	F	p
Experience	1	.081	7.15	<.01
Sex	1	.013		
Interaction	1	.018		
Within	36	.011		

which of the entire interaction was rated as positive. The Mean for Non-CC Ss was 44.8%.

To a certain extent the difference between CC and Non-CC children on this variable may simply reflect greater activity by CC Ss. However, examination of the proportions for negative actions in Table 15 and Figure 7 support the validity of the finding. Negative actions by CC Ss did not increase commensurately during the same periods; they, in fact, showed a decline across the year.

Further examination using analysis of variance within each of the date blocks indicated that significant differences in positive interaction between CC and Non-CC Ss did not emerge until the April-May period ($F = 16.79$; $p < .001$, df 1/36)[2]. During this period CC Ss had a mean of 62.8% and Non-Cc Ss a mean of 45.3%.

The overall picture, therefore, on this variable, is one of dramatic increase in the amount of positive interaction for all children across the program year with an amazingly constant rate of increase for CC Ss but a leveling effect for Non-CC Ss toward the latter part of the year.

Recipients of social interactions. Certain other summarization figures were derived from the data which are of interest in contrasting the social repertoires of CC vs. Non-CC children. Since, in each minute observation, a recording was made of the specific p-er with whom the observed child had either verbal, gestural, or tactile interaction, it was possible to obtain a figure for each child which disclosed the proportion of any other S's total observations in which he was involved. These figures were used to determine for each of the Ss whether there were significant differences

[2]As in the case with the verbal interaction data, the results of these analyses suggest that a trends analysis is required which will more clearly define the interaction of sex difference and experience differences over time.

between the proportion of observations (from November through May) in which they as individuals were involved with girls vs. boys and CC Ss vs. Non-CC Ss. (The means of each child for CC and Non-CC interactions and boy and girl interactions are contained in Appendix B.) Table 17 has been arranged to summarize the direction of difference between means on interaction according to prior experience with special notation of the number for whom analysis of variance showed significant differences.

The clearcut differences in directionality derived from this kind of analysis and depicted in Table 17 reflects the persistant tendency of CC children to interact with each other rather than the "newcomers," Non-CC Ss. Newcomers then evidently turned to each other for play companions.

An examination of the data in Table 18 on the sex preferences for peer interactions shows, as would be expected, that for both CC and Non-CC groups boys generally play more with boys and girls with girls. There were only five exceptions to this pattern and only one of these was at the level of significance. Only four of the Non-CC Ss had significant sex differences in interactions while these differences were noted for nine of the CC Ss. This would seem to reflect somewhat greater sex differentiation and role awareness of the CC children.

Interactions with adults.

For each minute observation notation was also made of (1) whether the target child had verbal interaction with an adult, (2) whether the target child had gestural interaction with an adult, (3) whether the target child had tactile contact with an adult, and (4) which adult was the recipient of the interaction.

Verbal interaction with adults. The mean for all Ss for the seven-month, November-May period was 48.4%. On the average each individual

Table 17

TABULATION OF THE DIRECTION AND SIGNIFICANCE OF MEAN DIFFERENCES FOR PEER INTERACTION FOR SAME AND NON-SAME EXPERIENCE GROUPS

	CC Ss				Non-CC Ss			
	Higher frequency of Interactions with CC Ss		Higher frequency of interactions with Non-CC Ss		Higher frequency of interactions with CC Ss		Higher frequency of interactions with Non-CC Ss	
	M	F	M	F	M	F	M	F
Difference significant at .05 level	5	5	0	0	0	0	2	3
Difference not significant	3	6	0	0	0	1	6	7
No difference	1	0	0	0	0	0	0	1
Total	9	11	0	0	0	1	8	11
	20		0		1		19	

Table 18

TABULATION OF DIRECTION AND SIGNIFICANCE OF MEAN DIFFERENCES

FOR PEER INTERACTION FOR SAME AND NON-SAME SEX GROUPS

	CC Ss				Non-CC Ss			
	Higher frequency of interaction with Male Ss		Higher frequency of interaction with Female Ss		Higher frequency of interaction with Male Ss		Higher frequency of interaction with Female Ss	
	M	F	M	F	M	F	M	F
Difference significant at .05 level	3	1	0	5	2	0	0	2
Difference not significant	4	1	2	4	5	1	0	9
No difference	0	0	0	0	1	0	0	0
Total	7	2	2	9	8	1	0	11
	9		11		9		11	

child in the program was observed to be having verbal interaction with an adult during nearly half of his observations, The mean for CC Ss was 47.4% and Non-CC Ss 50.1%. There were no significant differences according to either experience or sex.

Gestural and tactile interaction with adults. The mean for all Ss for gestural interaction for the October-January time period was 16.6% and for tactile contact, 14.7%. Data were not derived for later time periods. There were no significant differences according to either experience or sex.

Recipients of adult-child social interactions. Summarization figures comparable to those derived for each child, (as described in the previous section under Recipients of social interaction) were also derived for each of the nine teachers who had a primary continuing responsibility for work with the children. Analysis of variance were performed to determine if there were sex or experience differences in respect to the recipients of adult verbal, gestural, and tactile interactions. No differences were found for any teacher on either sex or experience. Teacher contacts were evidently equally sought and/or distributed between both girls and boys, both CC and Non-CC children.

Summary and Discussion

The purpose of this report has been to examine selected behaviors of 40 three- and four-year-old children--half of whom had been enrolled in day care programs since infancy. The issue of concern is whether there are different patterns of use of an "open environment" program setting, which was standardly available to all, by those children with prior day care experience in contrast to those new to programs. An extensive observational program conducted during the 1970-71 academic year allowed the continued collection of data on these children across many months.

The findings of the study may be summarized as follows:

1. There were significant differences between CC and Non-CC children in regard to:
   a. The proportion of observations in which they were located in active area (CC > Non-CC)
   b. The proportion of observations in which they were located in expressive area (CC < Non-CC)
   c. The proportion of observations in which they were located in task area (CC < Non-CC)
   d. The proportions of observations in which there was verbal interaction with a peer (CC > Non-CC)
   e. The proportion of observations in which there was positive peer interaction (CC > Non-CC)
   f. The recipients of social interaction
2. There were not significant differences between CC and Non-CC children in regard to:
   a. The proportion of observations in which they were located in snack, inviational, or outdoor play areas

b. The proportion of observations in which there was gestural or tactile interaction

c. any dimension of adult interaction

3. There were sex differences on proportion of observations located in active area and expressive area and recipients of social interaction.

There seems reason to assume that, at least in some respects, the early day care children have developed differently than their non-day care peers. Furthermore, the kinds of differences that emerge from this study would not logically be expected to accrue from the kind of "disorganized" home situation claimed for the CC Ss in the Lally et al. (1971) report. That differences in choices of work-play involvements, that greater frequency of positive peer interactions, and that a very close-knit social structure of long-term "buddies" from the CC should be attributed to greater "familial disorganization" of CC Ss is quite unlikely. It does seem plausible, on the other hand, to assume that, whatever the effects of the traumatic life of some CC Ss, the stimulating early day care programs provided at the Children's Center made significant impact on their functioning and preferences.

The early day care CC Ss did indeed display interesting sets of behaviors. They verbalized to each other at a high rate. They sought each other out for play contacts in preference to other possible play companions. They had increasingly positive interactions with peers as they participated across the year within the SUECEC open setting. They seemed to find greater involvement and satisfaction in their own social interactions than from involvement with materials. They, to a greater extent than their

Non-CC counterparts, seemed able to develop activities from within their own social milieu wherever or whenever there was sufficient space or opportunity and, hence, seem to have less need for or interest in either expressive or task materials at their current stage of development.

The following excerpts from a narrative description of behaviors of a CC S in interaction with four other CC Ss are somewhat illustrative of the flavor of social interaction occurring in the active area.

> R. walks over to other children. "Come on, S., J., H. Come on, J. Come on." Looks at other children who have come to him. What team do you want to be on?" "Come on. You do just like this." R. demonstrates a 3-point football stance. "Now I gonna hike. I gonna block for you." R. runs. "J., I said block out other players." "Kick off, J." R. and J. tackle K. (a girl). "Don't kill her, J. Get on my side, K. C'mon, J. C'mon." "I'll teach ya'll how to do something. Teach you everything." R. walks around showing group one by one how to get set in football.

Although only the activities of R. are fully reported within the above narration of a five-minute sequence of behavior, the other children in the group were equally involved in the football activity. One can argue persuasively that the kind of organizational and cognitive skills required to arrange a set of three- and four-year-old peers into a sustained football activity are considerable. The performance of this particular child and many others of his CC peers in the active area often surpassed any requirements for successful participation with the most complex of task materials.

There are clearly two implications for further research and development activities related to defining the day care project. The first implication is a direct test of the conclusion that the performance characteristics in the active area can reflect the kinds of cognitive/social competencies that might be expected, on some intuitive basis, from children's work in the task area. This means that observations of the children's behaviors in the various settings must be examined in terms of their quality or their

relationships to known psychological characteristics of cognitive competencies. This work is currently underway.

The second implication involves examining the relationships between subject characteristics and use of the available areas in the day care facility. Assuming that children seek out those components of their environments which provide the optimal match between their cognitive competencies and the cognitive demands of the environment, it is possible to hypothesize that cognitively more mature children will use the Task area more frequently. Subject variables such as CA and performance on the Cognitive Competency Scale (a task now being developed at the Syracuse Center) will be used to categorize children and their use of areas examined. Ultimately, of course, it will be necessary to examine not only what areas children use but also the quality of their behaviors in those areas.

It is difficult not to draw parallels between the strong peer orientation obvious in this early child care group and the reports of Freud and Dann on group rearing (1951) or the various Kibbutz descriptions in which attachment and/or reinforcement patterns clearly deviate from the typical home-rearing patterns. We would emphasize, however, that there certainly seems no reason to fear any undesirable consequences from the differences described in this study. The early care group who were involved in highly stimulating Children's Center programs do indeed seem more advanced in certain respects to their less socially involved matches. Clearly, however, we lack a sufficient base of knowledge of the eventual consequences of developmental deviations to even hazard preliminary guesses as to the significance of differences. Further careful observational studies investigating on a longitudinal basis the impact of early group care participation

on children's motivational and attachment development are greatly needed. The findings of this study strongly support the contention that systematic behavioral observation is a viable methodological approach to disclosing differences along these dimensions.

APPENDIX A

CODES FOR OBSERVATIONS OF CHILDREN: INITIAL FORMAT

A. Location - Obs. indicates where S is in program setting

1. Active
2. Expressive
3. Task
4. Outdoors
5. Invitational room #1
6. Invitational room #2
7. Rest
8. Snack, lunch
9. Other - lavatory, hallway, etc.

B. 1-10 Names of female children
C. 1-10 " " " "
D. 1-3 " " " "

Observer indicates those with whom S has verbal, gestural, tactile contact

E. 1-7 Names of male children
F. 1-10 " " " "

" "

G. Kind of interaction

1. Verbal
2. Gestural
3. Tactile
4. Visual

H. 1-10 Names of staff/adults
I. 1-2 " " " "

Observer indicates those with whom S has verbal, gestual, tactile contact

J. Staff/adults

1. Male visitor
2. Female visitor
3. Self (observer)
4-9. Student teachers' names

Observer indicates those with whom S has verbal, gestual, tactile contact

K. Kind of Interaction

1. Verbal
2. Gestural
3. Tactile
4. Visual

L. Language Use - tells what doing
M. " " - indicates wants
N. " " - tells others to do
O. " " - asks help
P. " " - asks permission
Q. " " - asks how to do
R. " " - asks for name

S. Language use - asks meaning
T. " " - asks explanation
U. " " - asks information
V. " " - other

Note: For L through V S uses the following codes to indicate direction of language use

1. - adult to S
2. - S to adult
3. - peer to S
4. - S to peer
5. - S egocentric

W. Equipment in Active Area - Obs. indicates those with which S has contact
1. Jungle gym
2. Jungle gym - slide
3. Push cart
4. Steering toy
5. Ride toy
6. Cranes
7. Rocking boat
8. Hat
9. Tunnel
10. Large blocks

X.
1. Small blocks
2. Wodden animals/people
3. Rubber animals
4. Rubber people
5. Wind-up elevator toy
6. Houses
7. Trucks, cars
8. Other toys from small block area
9. Walking board

1. Equipment in Expressive Area - Obs. indicates those with which S has contact
   A. Paint-easel
   B. Paint-table
   C. Finger paint
   D. Crayons
   E. Paper

2. A. Paste
   B. Pencil
   C. Magic Marker
   D. Chalk
   E. Paper

3. A. Chalk Board
   B. Clay
   C. Clay + Plasticine
   D. Caly + Salt
   E. Scissors

4. A. Hammer
   B. Saw
   C. Work bench
   D. Mirror
   E. Stapler

5. A. Dress-up
   B. Dress-up purse or shoes
   C. Dress-up hat
   D. Ironing board or iron
   E. Rocking chair

6. A. Dishes
   B. Stove
   C. Refrigerator
   D. Cupboard
   E. Doll

7. A. Doll clothes
   B. Doll bed
   C. Doll buggy
   D. Telephone

12. Equipment in Task Area - Obs. indicates those with which S has had contact

   A. Books
   B. Records
   C. Puzzles - regular
   D. Puzzles - knobs
   E. Cylinders & discs

13. A. Color forms
    B. Stringing beads
    C. Parquet blocks
    D. Lego blocks
    E. Blocks and pegs

14. A. Plastic boards and tiles
    B. Picture dominoes
    C. Tinker toys
    D. Montessori seriation sets
    E. Links

15. A. Alphabet form board
    B. Etch-a-Sketch

APPENDIX B

MEANS AND RESULTS OF ANALYSIS OF VARIANCE FOR
EXPERIENCE AND SEX DIFFERENCE ON RECIPIENTS OF INTERACTION

	CC		Non-CC	Boys		Girls
CC-Boys						
1	.046	>	.010*	.038	>	.017
2	.014	>	.006	.008	<	.012
3	.031	>	.014**	.026	>	.018
4	.011	>	.010	.013	>	.009
5	.031	>	.013*	.032	>	.012*
6	.028	>	.017	.033	>	.013*
7	.017	>	.017	.020	>	.014
8	.018	>	.007*	.012	<	.013
9	.051	>	.012**	.046	>	.017*
CC-Girls						
1	.024	>	.009*	.012	<	.025
2	.027	>	.006	.019	>	.015
3	.045	>	.016**	.046	>	.015**
4	.008	>	.007	.006	<	.011
5	.031	>	.017	.012	<	.036*
6	.028	>	.014*	.013	<	.029*
7	.035	>	.021	.016	<	.040*
8	.043	>	.006	.008	<	.012
9	.043	>	.010**	.012	<	.041**
10	.026	>	.010	.007	<	.029*
11	.018	>	.004*	.007	<	.015

** $p < .01$
* $p < .05$

Appendix B (Cont.)

	CC		Non-CC	Boys		Girls
Non-CC Boys						
1	.005	<	.009	.007	>	.006
2	.003	<	.009	.009	>	.003
3	.005	<	.012**	.011	>	.006
4	.003	<	.019*	.011	>	.011
5	.008	<	.013	.012	>	.010
6	.010	<	.015	.017	>	.008*
7	.010	<	.013	.014	>	.009
8	.010	<	.015	.020	>	.005**
Non-CC Girls						
1	.028	<	.036	.024	<	.040
2	.004	<	.011	.005	<	.009
3	.016	<	.028	.016	<	.028
4	.005	<	.011	.003	<	.019
5	.009	<	.019*	.014	<	.015
6	.008	<	.016	.008	<	.016
7	.015	<	.044	.019	<	.041
8	.006	<	.013*	.008	<	.011
9	.007	<	.027**	.020	>	.013
10	.018	<	.018	.017	<	.020
11	.008	>	.007	.004	<	.011*
12	.011	<	.016	.009	<	.018*

**p < .01
*p < .05

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