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ABSTRACT

In order to assess the quality of stimulation in the home environment, the Inventory of Home Stimulation (HOME) was used as part of the evaluation strategy for the Houston Parent Child Development Center Program, which attempts to help parents develop their competence as teachers of their own children. One hundred low income, Mexican American families were randomly assigned to program or control groups. The Bayley Infant Scales of Development were used at 12 and 24 months, and the Stanford-Binet at 36 months as measures of general intellectual functioning. Palmer's Concept Familiarity Index and a measure of bilingual development were also used. Along with HOME, the parent assessment battery included a long interview, several verbal-attitudinal measures, measures of second language learning, and a videotaped, structured mother-child interaction situation. Results have shown significantly higher scores for the program group at the end of the program. However, the relationship of HOME scores to child cognitive scores was not clearly patterned. This may be partly due to the narrow range of scores, but the presence of some negative correlations suggests the possibility of cultural differences which alter the pattern of relationships between the family environment and child cognitive functioning. (BW)

MEASURING THE LEARNING ENVIRONMENT OF MEXICAN-AMERICAN FAMILIES IN A PARENT EDUCATION PROGRAM

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One of the important developments in early childhood education is the turn to parent education as a way of enhancing and maintaining child competence. This development has also presented new problems of program evaluation. It is no longer sufficient to assess changes in the child alone; careful attention must be given to the child's total home learning environment and this means including characteristics of the parents. To evaluate the effectiveness of parent education programs we must measure changes over time in the parents' behavior with regard to their children. We must be concerned with the characteristics of the home as a system for learning stimulation and support.

The evaluation of large parent education programs places heavy demands on the measurement methodology. The measures can not require too much administration time, they should not interfere unduly with ongoing family activities, they must be sensitive to the home's environmental "richness" and to changes in this richness over time, and they should be relevant to the program's theory of developing child competence. Furthermore, they must offer high inter-observer reliabilities and provide relatively stable measures over time.

In designing an evaluation stategy for the Houston Parent-Child Development Center we examined a large number of procedures, tried many, and on the basis of our work with pilot groups, have continued to use a few. The Inventory of Home Stimulation, or HOME, is one of the few that have seemed promising and our experience with it will be reported here. This inventory assesses the quality of stimulation in the home environment. Scores are based on interview and observational data.

PROGRAM

It may be helpful at this point to provide a brief description of the Houston PCDC.[1] This program is designed for low-income Mexican-American families. Our program is one of three PCDC"s--the others are in Birmingham and New Orleans. All three model programs have demonstrated short term effectiveness and are now being replicated in several new locations.

The goal of the program is to help the parents, chiefly the mothers, to develop their competence as teachers of their own children, in order to enrich the home as a preschool learning environment. The Houston program goals derive from a view that child competence develops optimally when parents are affectionate, use non-restrictive control methods, emphasize verbal interaction and view the home as a valuable learning environment for their children.

The program itself spans a two-year period, beginning when the child is one year of age. In the first year, the mother is visited in her home once a week by a teacher. In addidtion, in order to involve fathers and other family members, several weekend sessions are held on such topics as communication and decision making in families.

In the second year, mother and child attend a center-based program four mornings a week. The mothers participate in homemaker sessions in sewing, nutrition, and family health, as well as in child care and management. The children participate in a nursery school and join their mothers in some training activities. There are a number of evening sessions for the fathers. Fathers also participate on the Parents Advisory Council. Mothers interested in learning English attend language classes during both years.

Our emphasis is less in "teaching" the mothers than on helping them to act on the basis of what they already know and providing opportunities to reflect on these actions with other mothers and the teachers.

PROGRAM EVALUATION

The program evaluation begins with the random assignment of eligible families to program or control groups. Approximately 100 families each year are so assigned. Relatively few measures are obtained on the children in the early years, but they will receive a more extensive battery during the follow-up period. We have used the Bayley Infant Scales of Development at 12 and 24 months and the Stanford-Binet at 36 months as measures of general intellectual functioning. There is also a measure of bilingual development and Palmer's Concept Familiarity Index is used as a criterion measure for one aspect of the curriculum.

The mother assessment battery is more extensive. It includes a long interview on the family, several verbal-attitudinal measures, measures of second-language learning, and a videotaped, structured mother-child interaction situation. And, of course, we have used HOME.

As to the general program effectiveness, very briefly, we have found significant group differences on the various child tests, particularly the Stanford-Binet and very strong group by time interactions on the Mother-Child interaction situation. All of these have favored the program group and are in accord with program goals. There have been a number of other evaluation results of interest, but we cannot go into them here.

Before presenting our HOME results, it is necessary to explain a few matters of procedure. The data we will offer are from three cohorts representing three annual groups (D, F and G) that have gone through the program or were controls. The first cohort received the weakest program experience. Furthermore, although all cohorts were recruited from the same area and assigned in the same way, there seem to be some differences between them. There was a change in our HOME administration procedure between 12 months and 24 months for the F group resulting in somewhat higher later scores. This shows up on Figure 1 as a large difference between time 1 and time 2 Total scores. The procedural change was the same for experimental and control groups.

RESULTS RELIABILITY

Inter-observer reliabilities have been checked many times. Observers consistently show 90% and better agreement on all items. The procedures are clear and judgments not too difficult to make consistently.

Stability

Looking at the stability of the HOME scores across the three time periods we find highest correlations for the Total score. Of the category scores, number IV, "Provision of appropriate play materials," is consistently high. The least stable category is II, "Maternal involvement with the child." As might be expected, the control group correlations are considerably higher than those for the experimental group. There is one odd exception: One of the few significant correlations across all three cohorts for the experimental group was on category II, "Avoidance of restriction," between ages 2 and 3. Just why this occurred is not at all obvious.

Program Effects

Tables 1 and 2 show the results for mothers who completed the program for the F and G cohorts. As there were no significant differences for the D cohort on HOME we have not included a table. As may be seen in Table 1, significant differences appeared for the total score at time 2 and for categories III, IV and Total at time3. Although we have not done statistical tests for G cohort differences because all of the subjects have not yet been tested, the results seem to be in line with those for Cohort F. The pattern of results is perhaps better seen by referring to Figure 1. The decline in total scores for the cohort at time 3 is puzzling and we believe misleading. The second year of the program is much more involving of mothers' time and efforts than the first year and it is our impression, shared by the mothers, that it is the time of greatest learning. The results for the G Cohort meet our expectations much more closely.

How valuable is HOME as a measure of program effectiveness? It is hard to say. We have obtained significant group differences and they are in line with differences obtained on child tests and on our videotaped mother-child interaction measure. This convergence of results supports the idea that HOME is a valid evaluation measure. However, the fact that the differences are not great, suggests to us that the measure is rather conservative. Quite likely, mothers must change their households and ways of relating to their children a great deal before these changes appear in HOME Scores.

Comparison with other Studies

Inasmuch as the subjects of our research are Mexican-American and there has apparently been no other research using HOME with this ethnic group, it is tempting to make group comparisons. Is the home learning environment of Mexican-American families different from that of Black or Anglo families? Are there cultural differences? Actually, however, we cannot go very far toward answers to these questions because we do not have a clear body of comparative data available as yet. Bradley and Caldwell kindly sent us some of their results and we have placed their mean scores in our Figure 1 with Xs. They reported no data on 36 month olds. Their results and ours are quite similar for categories III, V, and VI. Category I is also similar in that their results and our F cohort results begin at the same point and increase over time. However, our G cohort data are different. Our category II, "Avoidance or restriction," scores are higher and on category IV, "Provision of Appropriate play materials" our families show a sharp increase in scores

between 12 and 24 months whereas theirs are initially higher but remain at the same level. Furthermore, our 24 month Total scores are much higher than theirs. These differences may be culture-related, but we cannot be sure at this time.

Correlations With Other Measures

In a large matrix of correlations between HOME and a number of demographic and variables for our D of F cohorts we found high HOME scores were related to high family income, small family size, and more education of the mother. HOME scores were also related to mothers' achievement values non-traditional family role relationships, and to English language ability. All of this seems to point to high HOME being associated with a kind of American middle-classness.

Correlations With Child Test Scores

The correlations obtained between HOME scores at three ages and child cognitive scores at the same three ages appear in Table 3. Please note that HOME was not administered at 12 months for the D cohort. Also note that coefficients without stars were significant at the 10% level.

When we compare experimental and control groups on these correlations we see that there are many more significant correlations for the controls than for the experimentals. Of 14 significant concurrent relationships for experimentals and controls only one is significant for the experimental group and of the 17 significant predictive relationships, only 4 significan for the experimentals. Again, we find the suggestion that program experience breaks up the ordinary statistical relationship between home environment and child scores.

Next, we should examine cohort differences or similarities in relationships, first looking only at concurrent and predictive relationships. By "predictive " we mean, predicting child scores from earlier HOME scores. The 12 month HOME shows a number of significant correlations for the G cohort, but they are largely with the 12 month Bayley Mental Development Index and the Stanford-Binet. Correlations for the F cohort were lower, only one was significant at the .05 level, and they are more scattered.

For the 24 month HOME the D cohort shows no concurrent relationships, but rather strong predictive correlations with the Stanford-Binet. Conversely, the F cohort shows several concurrent relationships but nothing significant with the Stanford-Binet. Perhaps most striking here is the complete absence of relationships for the G cohort.

The 36 month HOME shows strong G cohort relationships with the Stanford-Binet and one category significant for the D cohort. Again, the F cohort is absent.

The three cohorts are clearly different in these variables and we have some leads about the reasons: for example, the standard deviations of the child tests for the F cohort were much smaller than for G. This helps account for the relative absence of strong correlations for the F group. Actually, we will not know why they differ until we more carefully explore the other characteristics of the groups. We intend to make such an exploration before combining the three groups.

Of the various HOME subcategories IV, "Provision of play materials,"

Total, Category III, "Organization of the environment," and V, Maternal involvement with child," show the largest number of correlations and the highest coefficients. Category II, "Avoidance of restriction," was totally unrepresented.

There remains one other review of the results in Table 3. It is the relationship obtained between early child test scores and later HOME scores. The number of such relationships is not small and the coefficients are as large and patterned as for concurrent and predictive relationships. They are not likely a function of mere chance. We will not try to explain them now beyond saying that we know from what Richard Bell and others have been saying, that an interactive relationship does exist between child and mother and that it is at least easier and more interesting to be a good teacher of a bright, interested child than one who is less responsive; in a sense, the child is a teacher of the mother.

Developmental Considerations

We have also wondered whether the developmental level of the child, as roughly indicated by age, has an influence on HOME scores. In examining this, we have looked at patterns of scores across time on the specific items. Our computer printout gives us the percent of mothers getting positive score on each item.

There is a tendency for certain items to show a U-shaped curve over three time periods. They are relatively high at 12 and 36 months and low at 24 months. Looking at both F groups this pattern appears for the "father as caretaker" and for the control group only, "Mother doesn't restrict child during the visits." The other pattern, low, high, low, appeared several times: for both groups, "mother uses 'teaching style'". "at least 10 books visible", "child taken regularly to the doctor," "mother consciously encourages developmental advance," "mother invests maturing toys with value via her attention" and "mother purchases challenging toys." The differences across ages here are great. On the "encourages developmental advance", item, for example, the percentages are approximately 30%, 90% and 45% for the three times. The age differences over these items are striking and clearly indicate that two-year-olds draw certain maternal attentions that are not appropriate for younger or older children. What this means for the measure as a program evaluation instrument where time comparisons are being made is that an increase in scores for 1 or 2 year olds is built in, as is a decrease for the 2 to 3 year period.

There are other patterns, but this is not the time to explore them. The usefulness of the measure may depend on careful analysis of developmental change effects on the items.

Conclusions

Our experience with HOME as a parent education program evaluation measure leads us to regard it as fairly sensitive and effective. We have obtained differences between program and control families that are congruent with results on other tests of the families and with the program goals. HOME scores are related to measures of child intellectual functioning done at the same time and they predict the child's later test scores. Furthermore, inter-observer relabilities are very

high and the scores are relatively stable over time.

Problems remain. It is evident that the measure is somewhat child-age specific. This is a serious problem if the measure is used in evaluation without a control group, especially since some scores may decline, as a function of child age, between ages 2 and 3.

It is now necessary to further explore the meaning of HOME scores by applying the method to other groups and carefully examining the resulting scores in the context of other known variables.

Other descriptions of the program appear in

Johnson, D. L., Leler, H., Rios, L., Braudt, L., Kahn, A. J., Mazeika, E., Frede, M., & Bisett, B. The Houston Parent-Child Development Center: A parent education program for Mexican-American families. American Journal of Orthopsychiatry, 1974, 44, 121-128.

Johnson, D. L. The development of a program for parent-child education among Mexican-Americans in Texas. In B. Z. Friedlauder, G. M. Sterrett, & G. E. Kirk (Eds.) Exceptional Infant. Vol. 3 Assessment and intervention. New York: Brunner/Mazel, 1974.

Leler, H., Johnson, D. L., Kahn, A. J., Peña Hines, R., & Torres, M. The Houston model for parent education. Society for Research in Child Development convention, April 1975, Denver, Colorado.

TABLE 1

HOME INVENTORY RESULTS FOR MOTHERS

AT THREE DATA POINTS FOR TIME 3 SUBJECTS ONLY

(COHORT F)

N = 20 EXPERIMENTAL, 26 CONTROL

Categories Groups	Time 1 12 Months		Time 2 24 Months		Time 3 36 Months	
	Mean	SD	Mean	SD	Mean	SD
Category 1						
Experimental	7.8	(1.7)	10.0	(1.0)	9.6	(1.1)
Control	7.3	(2.1)	9.7	(1.4)	9.3	(1.6)
Category 2						
Experimental	6.0	(1.1)	6.2	(1.3)	6.5	(1.2)
Control	5.8	(1.0)	5.9	(1.0)	6.0	(1.2)
Category 3						
Experimental	4.6	(1.1)	5.5	(0.8)	5.2	(0.6)*
Control	4.1	(1.1)	5.3	(0.8)	4.7	(0.8)
Category 4						
Experimental	4.4	(2.5)	7.2	(1.7)	7.6	(1.4)**
Control	4.2	(2.1)	6.2	(1.8)	6.2	(1.8)
Category 5						
Experimental	2.8	(1.7)	4.8	(1.1)	3.6	(1.7)
Control	2.2	(1.3)	4.2	(1.4)	3.2	(1.7)
Category 6						
Experimental	2.8	(1.2)	3.6	(1.2)	4.0	(1.2)
Control	2.5	(0.8)	2.6	(1.5)	3.2	(1.6)
Total Score						
Experimental	28.4	(4.9)	37.2	(4.0)	36.4	(3.7)**
Control	26.1	(4.9)	34.0	(4.9)	32.5	(4.9)

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

Categories:

1. Emotional and Verbal Responsivity of Mother
2. Avoidance of Restriction and Punishment
3. Organization of Environment
4. Provision of Appropriate Play Materials
5. Maternal Involvement with the Child
6. Opportunities for Variety in Daily Routine

4-75

TABLE 2

HOME INVENTORY RESULTS FOR MOTHERS

AT THREE DATA POINTS FOR TIME 3 SUBJECTS ONLY

(COHORT G)

N = 15 - 17, EXPERIMENTAL; 10 - 16 CONTROL

	Time 1 12 Months		Time 2 24 Months		Time 3 36 Months	
Category Groups	Mean	SD	Mean	SD	Mean	SD
Category 1						
Experimental	9.1	1.7	9.2	1.6	10.3	1.0
Control	10.1	0.9	9.8	1.4	9.2	2.3
Category 2						
Experimental	6.1	0.8	5.9	1.1	6.1	2.4
Control	6.3	1.0	6.2	0.9	6.4	1.2
Category 3						
Experimental	4.8	1.4	5.0	1.1	5.1	1.0
Control	5.3	0.7	5.1	0.9	5.1	1.3
Category 4						
Experimental	5.4	1.5	7.8	1.7	8.1	1.0
Control	5.5	1.6	7.3	2.1	6.8	1.9
Category 5						
Experimental	4.1	1.6	3.5	1.6	3.5	1.8
Control	4.5	1.1	3.8	1.5	4.2	1.8
Category 6						
Experimental	3.1	0.9	4.2	0.8	3.9	0.8
Control	3.0	0.8	3.3	0.9	3.1	1.2
Total Score						
Experimental	32.5	5.1	35.6	5.5	37.0	5.5
Control	35.0	4.1	35.4	4.9	34.6	7.4

Categories:

1. Emotional and Verbal Responsivity of Mother
2. Avoidance of Restriction and Punishment
3. Organization of Environment
4. Provision of Appropriate Play Materials
5. Maternal Involvement with the Child
6. Opportunities for Variety in Daily Routine

4-76.

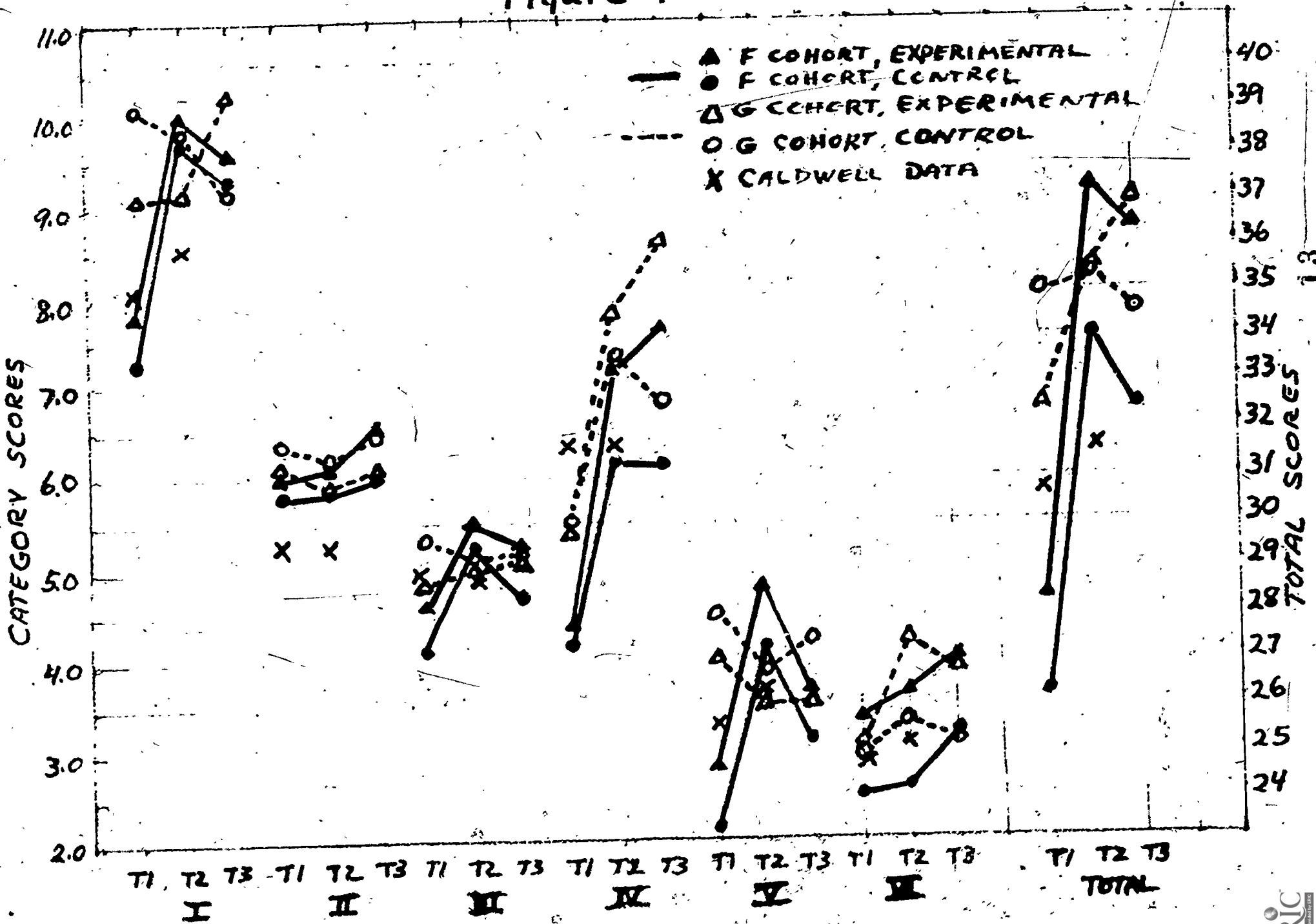
TABLE 3

CORRELATIONS BETWEEN HOME AND CHILD COGNITIVE SCORES AT CHILD AGES 12, 24, AND 36 MONTHS

HOME		12 MONTHS BAYLEY MDI COHORT				24 MONTHS BAYLEY MDI COHORT				36 MONTHS STANFORD BINET COHORT			
		D		F	G	D		F	G	D		F	G
		E	C	E C	E C	E	C	E C	E C	E	C	E C	E C
12 MONTHS	I	NOTAL			43 40	NOTAL		35		NOTAL			48
	II							34					
	III				81**				57				55* 58*
	IV			42*					45 52				56*
	V				73**							34	54* 70**
	VI							38					56*
	TOTAL				59*				58				57* 75**
24 MONTHS	I			41*				36					
	II				-60*								
	III	38			-45					50*			
	IV	54**		49**				44* 44*		58**			
	V			46*	50			38*					
	VI			39*								36	
	TOTAL	43*		61*				41 38*		53*			
36 MONTHS	I	-39			64*								60*
	II												
	III	55**			50*63**	44			63*				64*
	IV	72**			46			37 32		46 52*			76**
	V	49**			56*				67*				59*
	VI	61**			52*								
	TOTAL	71**			51*64*				55	52			72**

E = Experimental C = Control * = P < .05 ** = P < .01 No Star = P < .10

Figure 1


▲ F COHORT, EXPERIMENTAL
● F COHORT, CONTROL
△ G COHORT, EXPERIMENTAL
○ G COHORT, CONTROL
X CALDWELL DATA
CATEGORY SCORES
TOTAL SCORES
11.0
10.0
9.0
8.0
7.0
6.0
5.0
4.0
3.0
2.0
40
39
38
37
36
35
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27
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25
24
T1 T2 T3 T1 T2 T3 T1 T2 T3 T1 T2 T3 T1 T2 T3 T1 T2 T3 T1 T2 T3
I
II
III
IV
V
VI
TOTAL