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ABSTRACT

The Ontario Institute for Studies in Education and the Canadian Mothercraft Society completed the first year of their 3-year day care demonstration project for advantaged and disadvantaged infants from 3 to 30 months of age. The program was designed to facilitate infants' cognitive, personality, and social development through personalized adult-child interaction, guided learning situations, free play and specialized care. Parent guidance, training of high school students as infant caretaker-teachers, and teacher inservice education were also project components. Infants in the program made significant gains over the first year in mental, social, and language development, especially for younger versus older infants compared with exclusively home-reared controls. Subsamples of advantaged infants showed mean test gains of 30 to 40 points over 17 months and disadvantaged infants 30 points over 13 months. Other measures of socioemotional and cognitive development and measures of student and parent functioning showed generally positive results. This paper is a more complete report of ED 041 632. (Author/WY)

An Integrated Program of Group Care and Education for Socioeconomically Advantaged and Disadvantaged Infants

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1. Objectives. This is a demonstration program on group day care and developmental education of infants being carried out in collaboration with Canadian Mothercraft Society in Toronto, Canada. Our primary goal is to optimize the cognitive and socio-emotional development of infants between 3 and 30 months of age through study and control of activity in the center and home. Among supporting objectives are (1) to study children and families of advantaged, middle class working mothers and disadvantaged working class (welfare) families;

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(2) to develop programs, materials and measures; (3) to develop a parent guidance and education program; (4) to train high school students as infant caretaker-teachers; (5) through inservice training to develop teachers, graduate researchers and students.

The conceptual framework for the program, evolved through a series of investigations on young children, centers on the developmental learning of competence (Fowler, 1965,in press). Competence is conceptualized as a matrix of cognitive-affective processes (skills, concepts, rule understandings, language and personality-cognitive styles) organized as a self-regulating and adaptive system developmentally acquired through a series of interactive encounters between organism and environment.

2. Method

Design. The plan involves continuous development of a total program and component research projects on infant care and developmental education, embracing physical care and cognitive, motor and socioemotional development, extensive parent guidance and one year student education programs over a three year period. The first year group was compared with home reared controls until "graduation" (CA 30 months). Development of all children was measured at entry and each fall and spring as well as for component research projects on a variety of cognitive and socioemotional measures. Students were evaluated fall, winter and spring and parents fall and spring after the first year.

Infant Program. The infant day is divided into three spheres of activity--eating, changing and other caretaking routines, free play indoors and out and periodic guided learning sessions. All caretaking and infant stimulation is carried out by teachers and Mothercraft students using play oriented methods developed by the first author (Fowler, mimeographed) which incorporate systematic cognitive orientations into a developmental nursery school framework. The developmental outcomes generally aimed for include autonomy, self-control, initiative, adaptive problem-solving and language and cognitive competence, and friendliness and social competence in relations with both peers and adults. There are also a variety of focused developmental learning projects (e.g., language rules, object-class concepts and language mediated discrimination learning) with small groups of children and special program methods (e.g., diagnostic monitoring) all under continual development.

3. Data Sources

Subjects. Cumulatively there are about 40 3 to 30 month old advantaged infants of working (N=30) mothers and infants from disadvantaged families; 17 first year Ss were matched with exclusively home reared controls in age, Bayley, Kohen-Raz (1967), and Personal Cognitive Scales, parents' education and, to a degree, number of siblings and similar characteristics.

Setting. Canadian Mothercraft was until recently, the only professionally staffed infant day care center and remains the only infant caretaker-teacher training center in Canada. Total care for infants up to age 30 months is provided year round on week days from 7:30 A.M. to 6 P.M.

Student and Parent Programs. Students are trained in a one year program in child development and infant care and education through lectures, discussions, tutorial demonstrations and guidance while in caretaking and educational roles. Regular guidance and communication with parents in child development and program orientations is maintained, based on a parent guide written by the first investigator (Fowler, mimeographed).

4. Results

During the first program year, as shown in Table 1 of Handout, the total sample of advantaged infants made significant mean gains over six months of 11.29 points on the Bayley Mental Scale compared with home reared control nonsignificant gains of 4.5 points. Neither group gained significantly on the Motor Scale. On three applicable Kohen-Raz subscales (Table 2), derived from the Bayley Mental Scale, day care infants advanced generally more than home reared controls but significantly only on Imitation and Comprehension.

The most significant gains during the first year, however (Table 3), are to be found in the high gains of subsamples of younger (N=7; Mean CA=10 months) versus older (N=10; Mean CA=19 months)

infants compared with controls on the two Kohen-Raz scales of Imitation-Comprehension and Vocalization-Social Contact-Active Vocabulary. There were only small, non-significant trends in favor of the younger subsample on the total mental and motor scales.

Long term effects as well as earliness of program participation are beginning to emerge in preliminary data analyses available over two program years on both advantaged and disadvantaged. In Table 4 are shown two advantaged groups (N=6 and 7) who entered the program at a mean age of 21.66 and 11.42 months, respectively, and remained for 10.08 and 17.14 months. The first group made almost no change, moving only from 118.67 to 121.33 points. The second group, who started earlier and remained longer, on the other hand, gained a mean of almost 30 points, advancing significantly from 114 to 143.57 points. It will be noted that the final testing for both groups was on the Stanford Binet. A subsample of 4 advantaged children increased from a mean of 107.5 to 145 or 37.5 points over 17 months, compared to a change for 3 controls from a mean of 96.3 to 113.7 or 17.4 points.

A sample of (N=5) of disadvantaged infants (Table 5) gained significantly a mean of 23.4 points on the Bayley Mental Scale over a mean of nearly 9 months (mean CA=3.9 to 13 months). Three disadvantaged infants gained a mean of 32 points over 15 months. Bayley Motor Scale changes were generally around average levels and increased no more than 10 points in any group.

At the end of the first program year advantaged children displayed generally high levels of socioemotional functioning on the Schaefer and Aaronson behavior inventory (Unpublished). Mean scores at the end of the year on positively valued scales, such as inquisitiveness, positive social response, perseverance and enthusiasm, were almost invariably high (from 14 to 16), while negatively valued dimensions, like negative affect, self-consciousness, passivity and hyperactivity, were generally much lower (from 10 to 12). On three personal-cognitive scales (autonomy, tension level and problem orientation), mean gains over the year were positive but not significant. At the end of the second year, both advantaged and disadvantaged infants display generally good social adaptation to strangers, to unfamiliar environments and in the quality of attachment relations to highly familiar caretakers.

On the basis of initial observations, student and parent development are also generally positive. During the first program year, the first groups of students gained significantly in Hunt's (1967) measure of general concept level, a measure which he reports to be associated with teaching competence. On this measure, development generally proceeds from the concrete to the abstract, the specific to the general, and from egocentrism to relativism, based on student paragraph completions about social rules.

Parents were found to score generally high, and several items, e.g., positive attitude to child interest in child's education,

correlated with gain scores on the Kohen-Raz Scales of Imitation and Comprehension and Vocalization-Social Contact-Active Vocabulary -- though none with the total Bayley Mental Scale.

5. Discussion

There are several implications to the consistently high, if not always so dramatic advances in cognitive development continuing to emerge in association with this comprehensive program of infant care and education. The first is the apparent value of a general, pervasive approach to stimulation for cognitive development, similar to a trend recently reported by Starr (1970) in several infant education projects. Although, methods are specific, they assume the form of play -- and interpersonally-oriented language linked, cognitive learning principles developed for all major domains of infant experience in day care and the home. Involvement, enthusiasm and coordination of parent care and teaching activities has been one of the most successful aspects of the investigation. The importance of emotionally warm and sensitive relations with the babies in all relations and teaching situations, formal and informal, is also considered to be germane to much of the cognitive facilitation and show up specifically in the interpersonal ratings of socioemotional responsiveness, adaptiveness to new situations and strangers, inquisitiveness and perseverence in play and problem solving. Seemingly, consideration of the child as a unitary, affecto-cognitive system is a useful frame of reference for designing optimal developmental care and learning programs. The latter consid-

eration also finds support in the cumulative developmental learning effects evident in the data so far in the apparent advantages accruing from earliness of exposure and duration of participation in the program. On the other hand, some differentiation in types of functioning is to be noted in the relatively lesser gains of children in motor (both gross and fine) development compared to most other areas, especially, language, general cognition and social competence.

Additionally, the marked and general advances in competence and sensitivity to infant care and education of high school students through a one year program of coordinated, theory-based and practical training augurs well for the establishment of large scale teacher education programs to meet the accelerating demand for infant care. Finally, the magnitude of many of the gains on both advantaged and disadvantaged children -- assuming continuing confirmation on larger samples over longer spans of development -- suggest a greater range of cognitive and socioemotional potential than generally realized in many cultures.

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Table 1

Comparison of Mean Change Scores on Bayley Mental and Motor Scales For Day Care Infants and Home Reared Controls: First Program Year

Period	Age in Months		Mental Scale (MDI)		Motor Scale (PDI)	
	Mean	Range	Day Care (N = 17)	Home Reared (N = 18)	Day Care (N = 18)	Home Reared (N = 16)
Time 1	15	4-24	111.47	103.22	98.61	104.19
Time 2	21	10-30	122.76	107.72	102.56	110.06
Change	6		11.29	4.50	3.95	5.87
t			2.22*	1.14	1.28	1.33

*p <.05 (two tailed)

Table 2

Comparison of Mean Change Scores (Age Placement) between Day Care and Home Reared Infants[a] on Three Kohen-Raz Subscales of Bayley Mental Scale: First Program Year

Period	Eye-Hand Scale 1			Imitation and Comprehension Scale 4			Vocalization-Social Contact-Active Vocabulary Scale 5		
	Day Care	Home Reared	Difference	Day Care	Home Reared	Difference	Day Care	Home Reared	Difference
Time 1	13.84	13.85		15.22	15.47		15.42	14.90	
Time 2	18.74	17.98		20.63	18.56		20.18	18.02	
Change	4.90	4.13	.77	6.02	3.61	2.41*	5.21	3.71	1.50

*$p < .05$ Wilcoxon (two tailed), but not t.

[a] N = 18 for each group at both testings except for Time 2 and change scores for Scales 4 and 5 for both groups.

Table 3

Comparison of Mean Change Scores (Age Placement) for Older and Younger Subsamples of Day Care and Home Reared Infants on Three Kohen-Raz Subscales of Bayley Mental Scale: First Program Year

Subsample	Eye-Hand Scale 1			Imitation and Comprehension Scale 4			Vocalization-Social Contact-Active Vocabulary Scale 5		
	Day Care	Home Reared	Difference	Day Care	Home Reared	Difference	Day Care	Home Reared	Difference
Older ≥15 months (N = 11)	4.77	3.63	1.14	4.75	4.18	.57	2.97	2.95	.02
Younger ≤14 months (N = 7)[a]	5.09	4.91	.18	8.35	2.55	5.80**	9.32	5.10	4.22*

*p < .05; **p < .01 (two tailed)

[a]N = 6 for Time 1 and Difference scores for Scales 4 and 5 for both Day Care and Home Reared Younger subsamples.

Table 4

Comparison of Mental Test Scores of Two Groups of Infants Varying in Age and Duration of Participation in Demonstration Program

	Infants	Time 1 Bayley Mental Scale (MDI)	Time 2 (MDI)	Time 3 Binet (IQ)	$T_1 - T_2$	$T_2 - T_3$	$T_1 - T_3$
	A		111	114		+3	
	B		151	137		-14	
	C	a	113	122		+ 9	
	D		100	115		+15	
	E		100	128		+28	
Group	F		137	112		-25	
A		$\bar{X}$	118.67	121.33		2.67	
		t				.3370	
(N=6)		df				5	
		$\bar{X}$ CA	21.66	29.33			
		$\bar{X}$ Mos. in Program	2.0	10.08			
		$\bar{X}$ Mos. in Day Care	15.08	23.33			
	T	107	127	143	+20	+16	+36
	U	124	121	146	- 3	+25	+22
	V	81	138	140	+57	+ 2	+59
	W	117	132	152	+15	+20	+35
	X	113	118	125	+ 5	+ 7	+12
	Y	136	125	129	-11	+ 4	- 7
Group	Z	120	134	170	+14	+36	+50
B		$\bar{X}$ 114.0	127.87	143.57	13.86	15.71	29.57
		t			1.6731	3.3622***	3.4657***
(N=7)		df			6	6	6
		$\bar{X}$ CA	11.42	17.57	26.71		
		$\bar{X}$ Mos. in Day Care	7.07	13.29	22.36		
		$\bar{X}$ Mos. in Program	2.0	8.21	17.14		
		Differences					
		$\bar{X}$		9.20	22.24		
		t		1.1001	3.1101***	1.4713	
		df		11	11	11	

a group A entered Mothercraft before program began, so not measured at this age.

* $p \leq .05$, 1 tail

** $p \leq .025$, 1 tail

*** $p \leq .01$, 1 tail

Table 5

Change in Bayley Mental Scale Scores (MDI) from Time 1 to Time 2 for a Sample of Disadvantaged Infants Participating in Demonstration Program for a Mean of 9 Months

N = 5

	Bayley Mental Scale MDI		
Infants	Time 1	Time 2	Change
N	118	136	18
O	80	126	46
P	78	105	27
Q	96	98	2
R	88	112	24
$\bar{X}$	92.0	115.4	23.4
t			3.2909**
df			4
Mean CA	3.9	13.0	
X Mos. in Day Care	1.2	8.8	
X Mos. in Program	1.2	8.8	
X Mos. in Program minus absences	-	7-8	

** $p < .025$, 1 tail