Applied Developmental Psychology
22 (2001) 333–361

Applied Developmental Psychology

Long-term effects of early intervention: Turkish low-income mothers and children

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Abstract

The two studies reported in this paper comprise the Turkish Early Enrichment Project (TEEP) spanning a period of 10 years. Both studies were conducted with mothers and children in low-income, low-education areas of Istanbul. Study 1 involved an examination over 4 years of the effects of two different types of early enrichment (intervention), child-focused (center-based) and mother-focused (home-based). Study 2 was a follow-up of Study 1, 7 years after the end of project intervention. Although both interventions produced superior cognitive skills and school adjustment at the end of the program, follow-up assessments in Study 2 revealed that parent-focused intervention had numerous sustained effects in terms of school attainment, higher primary school grades and vocabulary scores, more favorable attitudes towards school, and better family and social adjustment, while most effects of center-based intervention had dissipated (with the notable exception of negative effects of custodial, as opposed to educational, day care). It is concluded that home-based early enrichment through the mediation of the mother is a highly effective strategy with multiple positive outcomes in contexts of socioeconomic disadvantage.

Keywords: Intervention; Parental involvement; Early enrichment

1. Effects of early intervention

Along with organismic factors, the importance of early experience in the development of competence is well recognized (Bronfenbrenner & Ceci, 1993; Horowitz, 1993; Kagitcibasi, 1996; Shore, 1997; Wachs, 1993). This recognition has led quite directly to numerous efforts

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0193-3973/01/$ – see front matter
PII: S0193-3973(01)00071-5

to provide disadvantaged children with early experience that would enhance their ability to benefit from formal schooling, thereby increasing the possibility that they could enter adult life on a more equal footing with those from relatively advantaged backgrounds. Over the years, the results of intervention programs have been both encouraging and disappointing (Kagitcibasi, 1996, 1997a; Ramey & Ramey, 1998; Scarr, 1998; Woodhead, 1985; Yoshikawa, 1994; Young, 1997). Gains in cognitive ability have been regularly observed in the short-term, but they dissipate in the longer term (Cicirelli, Evans, & Schiller, 1969; Smilansky, 1979). On the other hand, studies show lower dropout rates, better school adjustment, and other beneficial long-term effects (Berrueta-Clement, Schweinhart, Barnett, Epstein, & Weikart, 1984; Lazar & Darlington, 1982; Schweinhart, Barnes, Weikart, Barnett, & Epstein, 1994).

A problem with the early negative evaluations, mainly of the Head Start program, was that they tended to consider only the first wave of results without waiting for later evidence regarding long-term effects. Later studies, looking at a wider range of outcome variables, have revealed positive results pointing to sustained positive effects, especially better school adjustment and social integration, which are attributed mainly to motivational factors (e.g., Berrueta-Clement et al., 1984; Lazar & Darlington, 1982; Zigler & Berman, 1983). Currently, there appears to be a general consensus on the long-term benefits of early enrichment, particularly for the social acceptance and adjustment of at-risk children (see, e.g., Campbell & Ramey, 1994; Kagitcibasi, 1996, 1997b; Ramey & Ramey, 1998; Schweinhart et al., 1994; Yoshikawa, 1994; Zigler, 1994; Zigler, Taussig, & Black, 1992).

There is also a recent focus on the possible long-term risk-prevention function of early childhood support programs (Yoshikawa, 1994; Zigler et al., 1992). For example, Yoshikawa points to four programs, mostly involving center-based early childhood education with parent training/family support, which show long-term reductions in antisocial behavior. These are the Perry Preschool Project (Berrueta-Clement et al., 1984; Schweinhart & Weikart, 1980; Schweinhart et al., 1994), the Houston PCDC Program (Johnson & Walker, 1987), the Syracuse University Family Development Research Program (Lally, Mangione, & Honig, 1988), and the Yale Child Welfare Research Project (Provence & Naylor, 1983; Rescorla, Provence, & Naylor, 1982; Seitz, Rosenbaum, & Apfel, 1985). Seitz and Provence (1990) stress the benefit of the caregiver-focused approach. Nevertheless, debate continues, mostly with regard to the best approaches to be used, such as direct (child-focused) or indirect/mediated (parent-focused) approaches, the duration and scope of the intervention, and the type and purpose of service.

Early intervention research outside of the USA, particularly in developing countries, is sparse (for recent reviews, see Kagitcibasi, 1997b; Myers, 1992; Young, 1997). Most of the issues raised in US research also apply to developing countries; however, important differences in sociocultural–economic contexts raise questions about generalizing US findings to other societies (Woodhead, 1985). There is a great need, therefore, for sound research into early enrichment in different contexts, both to learn about the diverse experience from around the world in this area and also to distinguish common basic processes from more culture-bound patterns.

2. Child-focused and parent-focused intervention

In practice, most programs have been center-based and child-focused, often supplemented with some parent involvement. The curriculum is usually designed to expose the child to various experiences that are ordinarily not provided in the economically disadvantaged family setting and to promote cognitive skills. Not all nursery schools or day care centers fit this description; some have no educational aims and provide only custodial physical care (Bekman, 1993).

Parent-focused intervention where parents are trained to teach various skills to their preschool children have been demonstrated to be feasible and cost-effective (e.g., Gordon, Guinagh, & Jester, 1977; Karnes, Teska, & Hodgins, 1970; Levenstein, O'Hara, & Madden, 1983; Slater, 1986). HIPPY (Lombard, 1981), for example, is being used extensively, both in the US and abroad, with variable results (e.g., Eldering & Vedder, 1993; Lombard, 1981, 1997); it was also a part of the intervention project presented here.

Long-term gains, some substantial, are reported for programs that combine cognitive enrichment of children with parent involvement and support. For example, the results of one intensive caregiver-focused program (the Yale Child Welfare Program: Provence & Naylor, 1983; Rescorla et al., 1982; Seitz et al., 1985) indicate that long-term effects may be stronger than short-term effects. Thus, the short- and the long-term effects may reflect different processes.

Nevertheless, programs that provide family services targeting parents without directly reaching children are often labeled parent-focused or home-based and are contrasted unfavorably with child-focused programs (e.g., Farran, 1990; Ramey, & Ramey, 1998; Wasik, Bryant, & Lyons, 1990). A review of six home-visiting programs in a recent issue of *The Future of Children* (Home visiting, 1999) finds serious problems, particularly with implementation, resulting in meager outcomes. However, parent education need not be confined to home visiting, and a child focus, that is, direct provision of learning experience to children, can be integrated with a parent-focused program as in the present project. Thus, child- and parent-focused approaches need not be alternatives. In fact, their combination promises to be more beneficial than either approach alone (Kagitcibasi, 1997a, 1997b; Seitz, 1990; Yoshikawa, 1994; Zigler et al., 1992). This is further supported by recent evidence coming from research with poverty populations and pointing to the importance of parent involvement in counteracting the negative effects of poverty, extending into adolescence (e.g., Eccles & Harold, 1993; Kagitcibasi, 1996, 1997a; Korenman, Miller, & Sjaastad, 1995; Lee & Croninger, 1994; Masten & Coatsworth, 1998; McLoyd, 1998).

The present study, the Turkish Early Enrichment Project (TEEP), comprises two studies: Study 1 is the original 4-year study, designed to investigate the separate and combined effects on children from economically deprived background of an educational preschool environment and a mother training program in the short run; and Study 2 is the longer-range follow-up conducted 6 years after the end of the original study (Bekman, 1998a, 1998b; Kagitcibasi, 1995, 1996, 1997a; Kagitcibasi, Sunar, & Bekman, 1988).[1] The original expectation and the

[1] Some partial and summary reports of these studies have been published previously (Kagitcibasi, 1995, 1996, 1997b; Kagitcibasi et al., 1988); the present report is, however, the first published report of both studies in their entirety.

main hypothesis of Study 1 was that both types of intervention would have beneficial effects on the cognitive performance and school success, and that they would interact in a mutually supportive fashion.

3. Study 1

3.1. Method

3.1.1. Design

The study was a field experiment with a $3 \times 2 \times 2$ factorial design, with three categories of early childhood care environment (educational nursery school, custodial day care, and home care: abbreviated as ED, CUST, and HOME, respectively), two levels of home intervention (mother training or MT, and no mother training or NMT), and two age levels (3 and 5 years at the beginning of the study). The first year of the 4-year study was devoted to baseline assessments; in the second and third years the home intervention program was applied; and the fourth year was spent in post-intervention assessments.

3.1.2. Participants

3.1.2.1. Children. A total of 280 children were selected at the beginning of the study. Nursery school and day care participants were selected from among the 3- and 5-year-olds attending three educational and three custodial centers serving lower-income families in Istanbul. A preliminary assessment of centers, using checklists and rating scales for facilities and activities as well as interviews with directors and teachers, had revealed three centers serving poor children which met the criteria for classification as educational centers (see Kagitcibasi et al., 1988). Two of the three educational centers were attached to private-sector factories and served the children of women working in the factories; the third was administered by the Foundation for the Protection of Children, serving the children of poor working mothers. The three custodial centers, which had no educational aims or activities but simply provided basic care and supervision, served the children of mothers working in the Turkish State Monopoly factories to which the centers were attached. Children were chosen from each center and each age group. In some cases, the participant group comprised of all the children available in the given age group at a particular center; where more children were available, participants were selected randomly. Children outside the specified age limits were excluded. The HOME-care sample consisted of children who were not attending any type of day care outside the home and were living in the same shantytown neighborhoods as the other two groups. All families had low socioeconomic standing, in terms of low parental income and education levels, rural origin, and shantytown dwelling. All children in this group were within the same age limits as the other two groups. This sample was obtained by contacting neighbors of other participants; very few of those contacted declined to participate.

3.1.2.2. Mothers. The mean age for mothers at the beginning of the study was 29.0 (32.8 for fathers). Mean years of school attendance for mothers was 5.36 (5.81 for fathers). The mothers of the ED and CUST children were employed outside the home, and the mothers of the HOME children were not, although many of them did piecework or other income-producing work at home. All the families had low income and lived in similar conditions, mostly in squatter housing in shantytown areas of the city. There were no significant differences among the groups in education, income, rural/urban origin, or type of residence. The mothers were invited to participate in a study of preschool education and were informed that their children would be observed and that they themselves would be interviewed. No payment was offered for participation.

At the beginning of the second year, half of the children at each age level in the smallest group, the ED group, were randomly assigned to the MT condition and half to the NMT condition. Due to the limited number and small size of the nursery schools meeting the educational criterion, the CUST and HOME groups were larger than the ED group. In order to keep the MT groups similar in size, approximately the same number of children as in the ED–MT group were assigned randomly from the CUST and HOME groups to the MT condition. This procedure resulted in a larger number of children and mothers in the NMT condition.

Also, approximately 10 mothers, or about 10% of those assigned to the MT group, mostly among the HOME mothers, were reassigned to the NMT group during the first 2 or 3 weeks of the MT program because they declined to participate in the program or could not arrange to attend the meetings. This also contributed to the relatively larger size of the NMT group.

By the end of the fourth year, the total number of participants was reduced to 255, representing a loss of 25 participants for an attrition rate of 9%. Several of the mothers who had originally declined to participate in the training program were observed to be among those who dropped out of the study altogether, leaving probably five or six reassigned mothers in the NMT group, none of whom had received more than two or three of the 60 training sessions. At the end of the fourth year, 90 mothers remained in the MT condition, and 165 in the NMT condition.

See Table 1 for the distribution of participants by age, care environment, and mother training.

Table 1
Design of Study 1

	Number of subjects in each group						
	Educational day care		Custodial day care		Home care		
Age of child	3 years	5 years	3 years	5 years	3 years	5 years	Total
Mother training	11	16	23	17	16	7	90
No mother training	18	19	30	35	34	29	165
Total	29	35	53	52	50	36	255

3.1.3. Materials

3.1.3.1. Child assessments.

Cognitive measures. Tests of intelligence and cognitive development were administered to all children in both the first and fourth years:

1. the Stanford–Binet Intelligence Test, translated and adapted for Turkish use;
2. the "Analytical Triad," consisting of three subtests from the Wechsler series of intelligence tests for children — the Block Design subtest from the WPPSI, the Object Assembly subtest from the WISC-R, and the Picture Arrangement subtest from the WISC-R (Savasir & Sahin, 1988);
3. the Children's Embedded Figures Test (CEFT), adapted for Turkish use by the research team;
4. tests of academic achievement in Turkish, mathematics and general ability (developed by the research team and a group of primary school teachers and administered in the fourth year only);
5. grades from report cards at the end of every year of primary school.

Some other measures not reported here were also administered.

Measures of personality and social development. In both the first and fourth years, all mothers were interviewed about those aspects of the child's personality and social behavior which it was expected would be impacted by the child's care environment and/or the mother training program: (1) autonomous/dependent behavior, (2) aggression, (3) self-concept, (4) school adjustment, and (5) emotional problems. Subscales pertaining to the first three concepts from Rohner's (1980) Parental Acceptance–Rejection Questionnaire (PARQ) were included in the fourth-year interview with the mothers. These items were translated, back-translated, and revised before inclusion in the interview schedule, and the response format was altered slightly to fit the requirements of oral interviewing. School adjustment was measured by the children's deportment grades at the end of every year of primary school. Emotional problems were assessed with Goodenough's Draw-A-Person test, using the total number of emotional indicators and the scoring system devised by Koppitz (1968).

3.1.3.2. Mother assessments. The home environments of the participants were observed, and the mothers were interviewed in-depth regarding their education, employment, and demographic characteristics; their child-rearing practices; their idea of a "good" child; their attitudes and aspirations for their children; their children's behavior; and mother's self-concept, world view, level of satisfaction (with self, with spouse, with child, etc.), intrafamily status (vis-à-vis her husband), and family relations in general.

3.1.3.3. Training materials. The mother training program consisted of two components, the Cognitive Program and the Mother Enrichment Program. The Cognitive Program consisted of an authorized Turkish translation and adaptation of the Israeli Home Instruction Program for Preschool Youngsters (HIPPY; Lombard, 1981), which focuses primarily on language,

sensory and perceptual discrimination skills, and problem solving. It can be considered a school preparation program, including preliteracy and prenumeracy skills. A set of worksheets was supplied to each mother every week during the months from October to May (no sessions were held during the summer), for a 2-year total of 60 weekly sets of about 25 pages each. Eighteen storybooks were also supplied at intervals.

The Mother Enrichment Program consisted of 60 biweekly guided group discussions (30 each school year for 2 years; Kagitcibasi et al., 1988). These group discussions constituted a significant part of the overall training program, which was designed to support mothers in their parenting and spousal roles and to provide them with better coping and communication skills. The program targeted the overall development of the child, the well-being of the mother, and healthy family relationships.

3.1.4. Procedure

The first year of the 4-year study was devoted to assessments of the children's cognitive, personality, and social development, and to assessments of mother and family variables. Since assignments to MT and NMT conditions had not yet been made, testers and interviewers (graduate and advanced undergraduate students) were blind to training condition. They were also not aware of hypotheses regarding care environment. For the next 2 years, excluding the summer months, the MT mothers received training in the program described below, while the NMT mothers received no training. During the fourth year, at which time the children were in the first and third grades of primary school, posttest measurements were obtained (for the most part by repeating the measures of the first year), and school grades were recorded. Once again, testers and interviewers were not informed either about conditions or the research hypotheses until after data collection was completed. None of the testers or interviewers was involved in the training activities.

The materials for the Cognitive Program were supplied to the mothers weekly, alternating between 1 week at home and 1 week in a group setting. Role playing and direct instruction were used to teach the mother how to use the materials with her child. The mothers then worked with their own children on a daily basis (15 to 20 min a day) to complete the week's tasks. The Mother Enrichment Program consisted of group discussions guided by the local coordinators as part of the biweekly group meetings, covering topics such as nutrition, child health, children's developmental needs, play activities for preschool children, discipline, and parent–child communication. The program was designed to sensitize the mothers to the needs of their children and to their own needs as women. These discussions typically lasted about 1 h. In addition to providing information and the opportunity to share experiences, the group discussions were oriented toward supporting the mothers in their parenting and spousal roles; in developing feelings of competence, efficacy, and self-confidence; and in developing effective interpersonal communication skills with their children, spouses, and others. The guided group discussions were made culture-sensitive and relevant to the mothers' everyday lives, and they helped participants, with group support, to find solutions to their problems and to develop better coping skills.

Two levels of paraprofessionals implemented the program. The group leaders, or "local coordinators" (one for each of the five low-income areas of the city in which the study was carried out), were adult women with relatively high education (at least high school) who

were specially trained and supervised by the research team. Prior to the beginning of the project, they participated in a week-long training program, and further training and feedback were provided periodically throughout the 2 years. In addition, members of the research team visited the meetings on a regular basis to monitor the performance of the local coordinators. The second group of paraprofessionals, called "mothers' aides," was selected from among the mothers in each group or from the same neighborhood, and they were similar in education and socioeconomic status to the participating mothers. They visited the mothers at home every other week to deliver that week's materials and to instruct them in their use, which took about 30 min. They also assisted in the biweekly group meetings, where instruction in the use of the cognitive materials again took about 30–45 min. The mothers' aides first applied the program to their own children before demonstrating it to the mothers in their home or assisting the local coordinators who taught it to the mothers in the biweekly meetings. They were trained every week before the meeting or home visits by the local coordinators, and their work was closely supervised by collecting the completed work sheets and by observing their performance in the group meetings. Local coordinators also occasionally visited the mothers in their homes to monitor the performance of the mothers' aides.

As a result of the close supervision at both levels, virtually all planned home visits were carried out, and very high rates of attendance at the biweekly group activities were maintained throughout the training period. For mothers whose children were in factory-provided day care, the meetings were held in space provided by the factories, and the women were allowed to take time off for the meetings (once every 2 weeks) through special arrangement with the project, ensuring virtually full attendance at most meetings. For other mothers, meetings were held in adult education centers in their neighborhoods, and the mothers' aides, who lived in the same neighborhoods, kept in close contact with each mother in their group, making sure that they attended meetings regularly. If a mother missed a meeting, the Mothers' Aide in her neighborhood visited within 2 days, supplying the week's materials and teaching her how to use them.

3.2. Results

3.2.1. Assessments of children

3.2.1.1. Cognitive measures. As a check on the equivalence of the groups assigned to the MT and NMT conditions, t tests were conducted on IQ scores from the first-year tests for the children in the two groups.[2] The difference did not reach significance, but there was a trend for the children in the MT group to have higher IQs (85.88 vs. 82.39, $t = -1.89$, $df = 254$, $P = .06$). Similarly, the ED group of children were found to have higher IQs than the CUST and HOME groups in the first year (87.4, 80.3, and 82.9, respectively) [$F(2,253) = 6.39$, $P = .002$].

[2] These are among the few data available from the first year. Most of the first year data were lost as result of a computer failure and could not be recovered. Analyses reported in this paper, which involve other first year data, were carried out before the data loss.

Table 2
Fourth year comparative standing of children on various cognitive measures (raw means)

Measure	ED	CUST	HOME	Total	*F* values	
IQ						
MT	94.19	90.80	92.89	91.21	Environment (2,244)	Training (1,244)
NMT	89	82.72	86.12	85.43	3.60*	18.37**
Total	91.30	86.00	87.66			
Analytical Triad						
MT	14.85	11.76	8.35	11.82	Environment (2,245)	Training (1,245)
NMT	11.63	9.84	8.09	9.58	16.09**	7.81*
Total	13.03	10.60	8.16			
CEFT						
MT	8.41	5.98	7.22	7.02	Environment (2,245)	Training (1,245)
NMT	7.37	5.40	6.66	6.32	5.68**	1.598
Total	7.82	5.63	6.84			

* $P < .05$.
** $P < .01$.

As a check on the equivalence of those children who dropped out of the study altogether after the first year and those who continued, *t* tests were conducted on their IQ scores from the first-year tests. No significant difference was found.

Unless otherwise specified, the results presented below are from 3×2 analyses of variance, with environment and mother training as the independent variables.

Tests of cognitive development. Table 2 presents the fourth-year mean scores on three of the cognitive measures (Stanford–Binet IQ, Analytical Triad, and CEFT) by care environment and mother training. Since preliminary analyses indicated no significant age differences, the age groups were collapsed. Using first-year IQ, Analytical Triad, and CEFT as covariates, MANCOVA was carried out with the fourth-year IQ, Analytical Triad, and CEFT scores as dependent variables and mother training and preschool environment as the independent variables. No significant interaction effects were found. All three covariates had significant effects on one or more of the dependent variables. First-year IQ influenced all three test scores [$F(1,215) = 100.38$, $P = .0001$; $F(1,215) = 65.56$, $P = .0001$; $F(1,215) = 27.84$, $P = .0001$], for IQ, Analytical Triad, and CEFT, respectively. First-year Analytical Triad influenced fourth-year Analytical Triad and CEFT [$F(1,215) = 5.83$, $P = .02$ and $F(1,215) = 6.81$, $P = .01$, respectively]. First-year CEFT influenced only fourth-year Analytical Triad [$F(1,215) = 18.34$, $P = .0001$]. There was a main effect of mother training on the combination of the dependent variables. Follow-up ANOVAs revealed that children in the MT group had higher fourth-year IQ scores [$F(1,215) = 11.6$, $P = .001$], and fourth-year Analytical Triad scores [$F(1,215) = 4.58$, $P = .03$]. There was also a main effect for preschool environment. Follow-up ANOVAs showed that children in the ED group had higher fourth-year Analytical Triad scores [$F(1,215) = 10.67$, $P = .0001$], and children in the CUST group had lower fourth-year CEFT scores [$F(1,215) = 3.2$, $P = .04$].

The first-year IQ means of the MT and NMT groups were 85.88 and 82.39, while fourth-year means were 92.08 and 85.25, respectively, revealing a greater intergroup difference. This

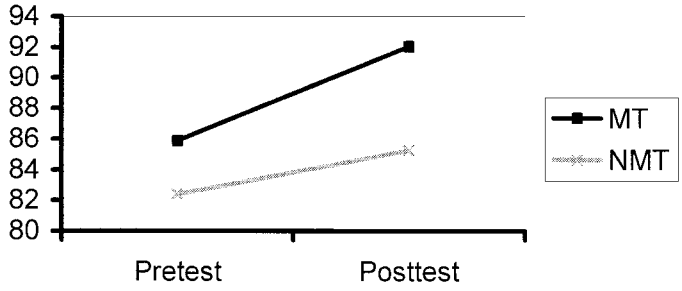

Fig. 1. First and last year IQ scores.

shows significant gains from mother training, despite some differences in IQ already existing in the first year (see Fig. 1).

Academic achievement tests. Table 3 shows mean scores for the three academic achievement tests (Turkish, mathematics, and general ability) by care environment and mother training. Since preliminary analyses showed that the two age groups had parallel patterns of scores, scores were collapsed across the age groups. Using first-year IQ, Analytical Triad, and CEFT as covariates, MANCOVA was carried out with the three achievement tests as dependent variables. No significant interaction effects were found. First-year IQ influenced Turkish and mathematics achievement scores [$F(1,187) = 51.18$, $P = .0001$ and $F(1,187) = 14.03$, $P = .0001$], respectively, but the other covariates had no significant effect. For general ability scores, the mother training effect was the only one to reach significance [$F(1,212) = 3.8$, $P = .038$]. Neither mother training nor preschool environment had significant effects on Turkish or mathematics scores.

Table 3
Fourth year achievement test score means

	ED	CUST	HOME	Total	*F* values	
Math						
MT	5.13	2.69	2.5	3.39	Environment (2,207)	Training (1,207)
NMT	3.77	2.75	2.54	2.91	5.27**	0.50
Total	4.36	2.73	2.53			
Turkish						
MT	6	4.31	5.29	5	Environment (2,212)	Training (1,212)
NMT	5.6	4.48	4.48	4.72	5.10**	0.32
Total	5.77	4.41	4.67			
General ability						
MT	27.22	27.85	28.14	27.71	Environment (2,212)	Training (1,212)
NMT	24.1	26.31	22.76	24.64	1.19	3.80*
Total	25.45	26.91	24.02			

* $P < .05$.
** $P < .01$.

Table 4
Fourth year school grades for 3- and 5-year-old groups[a]

		Age 3 group					
		EDU	CUST	HOME	Total	*F* values	
Turkish	MT	3.00	2.86	3.57	3.03	Environment (2,89)	
	NMT	3.82	2.20	3.06	2.98	2.77†	
	Total	3.50	2.74	3.20			
Math	MT	3.29	3.21	3.71	3.32		
	NMT	3.64	2.76	3.47	3.14		
	Total	3.50	2.96	3.54			
GNP	MT	10.14	9.73	10.86	9.95	Environment (2,89)	
	NMT	11.91	8.76	1041.00	9.86	3.24*	
	Total	11.22	9.15	10.54			
		Age 5 group					
		EDU	CUST	HOME	Total	*F* values	
Turkish	MT	4.30	2.53	3.14	3.22	Environment (2,80)	Training (1,80)
	NMT	3.83	2.48	2.00	2.61	6.19**	4.28*
	Total	4.05	2.50	2.31			
Math	MT	4.70	3.40	3.86	3.91	Environment (2,80)	Training (1,80)
	NMT	3.92	3.04	3.32	3.33	14.14***	2.82†
	Total	4.27	3.18	3.46			
GNP	MT	13.50	8.87	10.66	10.66	Environment (2,80)	Training (1,80)
	NMT	10.75	8.35	8.87	8.87	7.8**	4.50*
	Total	12.00	8.50	8.86			

[a] Grades in each course range from 1 (*lowest*) to 5 (*highest*). Report cards were checked in the homes. Overall, in 29% of the cases the report card could not be found. The highest rate of missing data is in the NMT 5-year-olds (35%) and the lowest rate is in the MT 5-year-olds (20%). Both age groups had the same proportion of report cards available (72.5%).

* $P<.05$.

** $P<.01$.

*** $P<.001$.

† $P<.10$.

School grades. Table 4 shows mean school grades at the end of the fourth year in Turkish, mathematics, and overall "academic average" (based on grades in Turkish, mathematics, and social studies combined), by care environment, mother training, and age group. Scores were analyzed using two-way ANOVA for each age group separately. Separate analyses were carried out because the younger children had just completed the first grade and thus had report cards for 1 year, while the older group entered elementary school in the second year of the study and accordingly had received report cards for 3 years by the end of the study. No significant interaction effects were found in any of the analyses.

For the Age 3 group, measured at the end of the first grade, there was a main effect for care environment on the academic average, with higher grades for the ED group and a near-significant trend for Turkish grades. Deportment grades also favored the ED group [$F(2,86)=3.27$, $P=.043$]. None of the other analyses yielded a significant effect. For the

Age 5 group, measured at the end of the third grade, there were main effects for care environment on mathematics grades, Turkish grades, and academic average. Main effects were also found for mother training on Turkish grades and academic average, and there was a near-significant trend for mathematics grades as well.

A further examination of the Age 5 trends in the grades of the MT group reveals progressively increasing gains over time. Even after 1 year of mother training, the MT group showed a nonsignificant trend toward higher grades; after the second year of mother training, the effects increased overall, with significantly better grades in Turkish and nearly significantly better grades in social studies [$F(1,80) = 11.19$, $P = .001$ and $F(1,79) = 3.29$, $P = .074$], respectively. Furthermore, 1 year after the end of mother training, positive effects continued to increase, with the MT group having a higher academic average (given above). For the Age 5 group (who had completed three years of school), the MT group's deportment/adjustment grades were also better than the NMT group [$F(1,79) = 4.22$, $P = .043$].

3.2.1.2. Measures of personality and social development. Table 5 shows mean scores on the dependency, aggression, and self-concept subscales from Rohner's (1980) PARQ by care environment and mother training. No significant interaction effects were found in any of the analyses.

While HOME children are found to be more dependent, MT children are rated as less aggressive. In self-concept, the CUST group is rated lowest and MT children are rated higher than NMT children.

School adjustment. Mean deportment grades at the end of the fourth year (first grade for the Age 3 group, third grade for the Age 5 group) were analyzed using two-way ANOVA, showing a significant main effect for mother training [$F(1,79) = 4.22$, $P = .043$], but no main effect for care environment.

Emotional problems. Total number of emotional problem indicators was analyzed by care environment and mother training. The results showed that HOME children had significantly more indicators than the ED and CUST groups [$F(2,198) = 4.82$, $P = .01$]. There was no significant effect of mother training.

Table 5
Mean scores on Rohner's (1980) subscales

	Dependency		Self-concept		Aggression	
Environment	MT	NMT	MT	NMT	MT	NMT
ED	14.21	11.60	30.96	29.60	19.88	17.12
CUST	13.65	13.82	29.76	29.00	19.89	19.04
HOME	11.88	11.93	31.25	30.58	17.94	18.48
	Environment (2,196)	Training (1,196)	Environment (2,191)	Training (1,191)	Environment (2,196)	Training (1,196)
F values	4.29 *	1.291	3.81 *	3.19	2.512	5.152 *
P	.015	.257	.024	.076	.084	.024

Higher scores on the Aggression subscale indicate lower levels of aggression.
* $P < .05$.

3.2.1.3. Assessments of mothers' attitudes and behavior. The following comparisons are all between the MT and NMT groups of mothers at the end of the fourth year, since there were no specific expectations regarding differences among the mothers of children in different preschool care environments. This is because the children were at the workplace day care centers, and the parents did not get to choose them from available alternatives. Since the direction of difference in each case was predicted, a one-tailed alpha level of .05 was used.

3.2.1.4. Mother's orientation to the child. The results from the first- and fourth-year structured interviews with the mothers are presented in Table 6. For the chi-square analyses,

Table 6
Mother's orientation to the child (in percentages)

		Fourth year			
	First year	MT	NMT	χ^2	*df*
Give full attention to child					
Frequently and very frequently	27.5	34.7	18.6	14.6**	4
Never and almost never	22	22	42.9		
Direct interaction with child	10.3	26.6	9.6	14.6**	4
Child plays alone	89.7	38.9	57.1		
Reading/telling stories	66.1	87.7	62.6	40.8***	3
Cognitively oriented teaching	15.2	32.2	25.6	23.33*	15
Help with homework	–	99	76	4.37*	1
What is a good child?					
Obedient (polite)	35	44	56.1	3.64*	1
Industrious	–	19.8	11		1
Autonomous	3.6	11	2.6	7.58**	1
Discipline					
Physical punishment	66.3	17.6	36.8	10.11**	1
Verbal punishment	53.7	41.8	57.4	5.63**	1
Reasoning/induction	19.6	26.4	16.1	3.77*	1
Giving advice	–	40.7	21.9	9.79**	1
Intentionality	41.1	60.7	39.3	4.47*	1
Verbal expression of satisfaction	12.5	73.5	58.1	6.01*	1
Expect school success without help	–	48.8	18.6	14.85**	5

	First year	Fourth year		*t*	*P*
Educational aspirations	14.9	14.5	13.9	2.03	.04
Educational expectations	13.6	11.6	10.2	2.11	.04

χ^2 are on the fourth-year data.
First-year data were collected and analyzed before assignment to MT/NMT condition.
In Turkey, 11th grade is the final year of high school.
* $P < .05$.
** $P < .01$.
*** $P < .001$.

figures refer to the percentage of mothers responding positively to the item, or the percentage giving the response indicated. For educational aspirations and expectations, the figures represent the mean number of years mothers desired and expected their children to go to school.

Interaction with the child. In response to the question "How often do you give your full attention to your child, other than meal times?" MT mothers reported more attentiveness in comparison to the NMT group in the fourth year. They also reported greater direct interaction with the child while together at home. (For comparison, Table 6 also presents results from the first year; while statistical analyses could not be carried out;[2] it is clear that MT mothers became more attentive and interactive over time, compared to the NMT mothers.)

Cognitive stimulation. MT mothers reported more involvement than NMT mothers in cognitively oriented activities (reading/telling stories and teaching) with their children, the greater availability of help at home with children's homework, and on a five-point scale they also gave higher estimates of their ability to help the child with homework ($t = 3.54$, $df = 215$, $P = .001$).

Attitudes and expectations. As shown in Table 6, in descriptions of a "good child," obedience was important for all groups, though stressed more by the NMT group; industriousness and autonomy were more valued by the MT group. In child discipline, MT mothers reported using less punitive methods and more reasoning and induction (making the child understand the consequences of his/her behavior), and they verbalized more in expressing dissatisfaction. They were also more likely to express satisfaction verbally (in addition to showing physical affection) as their children grew older. MT mothers were also more likely to take their children's intentions into consideration. When asked what they expected their children to be able to do on their own without asking for help, school success was the most frequent response for the MT group, consistent with their higher educational aspirations and expectations for their children.

4. Need for longitudinal follow-up

The results presented above show that both educationally oriented child-focused, center-based, and parent-focused approaches served to improve the children's cognitive skills, social relations, and school adjustment. However, as discussed earlier, the dissipation of early cognitive gains from preschool intervention is of great concern (Kagitcibasi et al., 1988), and some researchers concerned with the longer-term effects of early childhood intervention are emphasizing the long-standing claim of the importance of parent involvement in center-based programs (see Myers, 1992; Young, 1997; Zigler & Styfco, 1994). Thus, parent-focused intervention may extend beneficial effects further into the future and more broadly into the child's general development than center-based intervention. To assess the relative long-term benefits of the two types of intervention (mother training and early care environment), a follow-up study was carried out.

5. Study 2

5.1. Method

5.1.1. Design

Study 2 consisted of a follow-up carried out 6 years after the completion of the training program. The design of the follow-up study is essentially the same as that of Study 1, except that the age categories were dropped.

5.1.2. Participants

Of the 255 families remaining at the end of Study 1, 225 were located and 217 agreed to participate. The final sample consisted of 117 boys, 100 girls, their mothers (217), and half of their fathers (109). At interview, 108 of children were 13 years of age (left from 132 in the Age 3 group at the beginning of the study), while 109 were 15 years old (left from 123 in the Age 5 group); 55 of the children had attended educational preschool centers, 87 had attended custodial day care centers, and 75 had not attended any kind of preschool center. The overall distribution to the conditions of the follow-up study was very similar to that of the original study (Tables 1 and 7). At interview, 161 of the children were still enrolled in school, while 56 had dropped out (the Turkish system at the time made only the 5 years of primary school mandatory).

The 217 mothers (83 MT, 134 NMT) had a mean age of 39.1 and had attended school for a mean of 5.36 years. Two-thirds of them were currently employed, while the rest were housewives. The 109 fathers had a mean age of 42.8 and had attended school for a mean of 5.81 years. Two-thirds of them were skilled or semiskilled industrial workers, while the rest were unskilled workers, civil servants, small-business owners, or retired from one of the above-listed occupations. There were no systematic variations in education, income, or rural/urban origin among the different groups.

5.1.3. Materials and procedure

5.1.3.1. Children. The children (now young adolescents) were interviewed individually, covering attitudes toward school and education, relations with parents (current and retrospective), expectations for education and occupation, self-concept, and social adjustment. Most questions were closed-ended, having either a Likert-type or a similar five-alternative answer format, although a few questions were open-ended.

Table 7
Design of Study 2

	Number of subjects in each group			
	ED	CUST	HOME	Total
Mother training	24	37	22	83
No mother training	31	50	53	134
Total	55	87	75	217

The adolescents also took the vocabulary subtest of the WISC-R, standardized for Turkish respondents (Savasir & Sahin, 1988), and a paper-and-pencil version of the Embedded Figures Test (EFT) standardized for Turkish respondents (Okman, 1982). Their school grades, from first grade through their most recent year in school, were recorded from report cards seen at the homes.

5.1.3.2. Mothers. The mother interviews included questions on the children's educational orientation and social adjustment, the mother's child-rearing attitudes and practices, family relations, mother's educational and occupational aspirations for her child, mother's self-concept, and mother's role sharing, communication, and decision-making vis-à-vis the spouse (intrafamily woman's status). Most questions were closed-ended, with a five-alternative response format.

5.1.3.3. Fathers. The same format was followed in abbreviated interviews with fathers, carried out in the home by previous appointment. When possible, the interviewers worked in pairs, so that the mother and the child were interviewed separately but simultaneously to provide more privacy. Fathers were interviewed separately. Female interviewers carried out the mother interviews, while male interviewers carried out the father interviews. The children were all interviewed by female interviewers.

5.2. Results

5.2.1. Assessments of children

Unless otherwise indicated, the outcome variables for adolescents were all analyzed by two-way ANOVA, with mother training and preschool care environment as the factors.

5.2.1.1. Cognitive measures and academic performance. As a check on the equivalence of participants in the follow-up study and those who could not be reached or did not participate, *t* tests were conducted on the fourth-year IQ and Analytical Triad scores of the two groups; no significant differences were obtained for either of these *t* tests.

School attainment. Seven years after the end of the training program, a significantly larger proportion of the youngsters from the MT group (86%) were still in school, compared to those from the NMT group (67%). In a logistic regression analysis of school attainment, mother training entered the equation ($P = .0018$, $R = .179$), but no significant effect of early care environment was found.

A backward stepwise logistic regression analysis was carried out, using first-year IQ as a covariate. In this analysis, other than the covariate, only mother training entered the regression equation ($R = .16$, $P = .004$). A second backward stepwise logistic regression analysis was also carried out with fourth-year IQ as a covariate to determine posttreatment effects. Again, after the covariate, only mother training entered the equation ($R = .11$, $P = .025$), indicating that the effects of mother training continued beyond the end of the training program and were not associated with either initial sampling differences or short-term changes in IQ as a result of program participation.

Table 8
Adolescent's academic performance

	MT		NMT				
Primary school GPAs	Mean	S.D.	Mean	S.D.	*t*	*df*	*P*
Turkish	8.85	1.36	8.18	1.41	3.08	169	.002
Mathematics	8.15	1.75	7.32	1.75	3.01	168	.001
Overall academic	8.56	1.45	7.89	1.53	2.82	169	.002

Grades in a year that is repeated by a student are not recorded by the school and are not included in this table. Therefore, the figures represent the highest grades attained.

School achievement. Table 8 shows the mean grades for each group in Turkish and mathematics, as well as their overall average grades in academic subjects, over the 5 years of compulsory primary school. As the table shows, the children from the MT group had higher grades in mathematics and Turkish, and higher academic average. Because there was no significant effect of early care environment, it is not included in the table. When overall average grades were analyzed using first-year IQ, Analytical Triad, and CEFT as covariates, no main effects for either mother training or environment emerged, and none of the covariates showed a significant effect. However, there was a significant interaction between mother training and care environment [$F(2,205) = 3.52$, $P = .03$] due to a greater effect of mother training in the ED and CUST conditions, compared to the HOME condition (see Fig. 2). No significant difference in grades was found between MT and NMT children after primary school (of the 86% of MT and 67% of NMT groups still in school).

The CUST group was significantly more likely to have failed one or more years of middle school, compared to the ED and HOME groups [$F(2,216) = 3.45$, $P = .034$]. Grades from failed years (which may coincide with dropping out) were not recorded by the schools; rather, if the failed year was repeated, grades from the repeat year were recorded and these were used in the analyses. Thus, the analyses based on grades do not reflect a direct influence of early care environment on continued school attendance or grades. However, the greater failure rate of the CUST group suggests the presence of a direct influence.

WISC-R vocabulary test. Table 9 shows the mean scores on the WISC-R vocabulary test by mother training and preschool care environment. Using two-way ANOVA, a

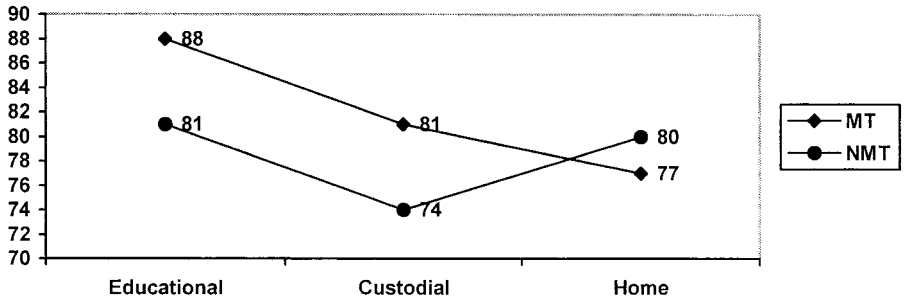

Fig. 2. Primary school grade average.

Table 9
WISC-R vocabulary test scores

	ED	CUST	HOME	Total	*F* values	
MT	46.28	46.14	44.00	45.62	Environment (2,215)	Training (1,215)
NMT	47.72	41.06	38.49	41.92	4.78**	4.63*

* $P < .05$.
** $P < .01$.

significant main effect was found for both mother training and preschool care environment. However, when first-year IQ was included as a covariate, both effects fell to nonsignificant levels ($P = .1$).

5.2.1.2. Academic orientation of the child. Table 10 shows the mean values by group for the items on the interviews with adolescents that yielded significant differences.

Reasons for going to school and studying. Adolescents rated on a five-point scale the importance of various reasons for going to school and for studying at home. The NMT group gave higher ratings to the importance of "following parents' wishes" and "having nothing better to do" as reasons for going to school [$F(1,216) = 6.08$, $P = .014$; $F(1,216) = 4.41$, $P = .037$], respectively. The CUST group rated "following parents' wishes" higher as a reason for studying at home [$F(2,216) = 3.29$, $P = .039$] (see Table 10).

Evaluations of academic performance. The CUST group rated themselves significantly lower on a five-point scale asking "how smart are you compared to the other kids?" [$F(2,216) = 3.67$, $P = .027$], and showed a near-significant trend to have lowest ratings on satisfaction with their own success [$F(2,216) = 2.57$, $P = .079$]. The CUST group was also lowest on an estimate of their parents' satisfaction with their success in school

Table 10
Mean scores on attitudes towards going to school, academic performance, and preschool preparation (items with significant differences only)

	MT			NMT		
	ED	CUST	HOME	ED	CUST	HOME
Could child be best in class if studied hard?	4.6	4.51	4.68	4.5	4.28	4.4
Having nothing better to do as a reason for going to school	1.6	1.59	1.73	1.83	2.04	2.02
Parent's wishes as a reason for going to school	2.32	2.68	2	2.5	3.02	2.94
How pleased child is with school success	3.8	3.49	3.73	3.43	3.24	3.57
How pleased teachers are with child's school success	3.76	3.46	3.77	3.6	3.24	3.51
How much preschool preparation helped	4.36	4.43	4.43	4.3	4.15	4.24
How long preschool preparation helped	5.2	5.49	4.86	4.81	4.27	3.84

[$F(2,216) = 3.76$, $P = .025$] and their teachers' satisfaction with their success in school [$F(2,216) = 3.75$, $P = .025$]. The MT group gave higher ratings to "Could you be the best in your class if you tried hard?" [$F(1,216) = 4.03$, $P = .046$], and to their satisfaction with their own school success [$F(1,216) = 4.02$, $P = .046$]. They also rated their teachers' satisfaction with their success higher [$F(1,216) = 3.65$, $P = .057$] (Table 10).

Preparation for primary school. Two-thirds of both the MT and NMT groups had attended day care, but 97% of the MT group, compared to 77% of the NMT group, believed they had been prepared for school before beginning primary school ($\chi^2 = 15.1$, $P = .0001$). Among those who felt they were prepared, the MT group believed that their preparation helped them more (4.41 vs. 4.15 on a scale of 5; $t = 2.07$, $df = 175$, $P = .02$) and that it helped them for longer (5.2 years vs. 4.3 years; $t = 3.01$, $df = 172$, $P = .0015$). HOME children, who had no day care experience, were much less likely than ED and CUST groups to state that they were prepared when starting school (64% vs. 96% and 93%, respectively; $\chi^2 = 27.42$, $df = 2$, $P = .0001$; see Table 10).

5.2.2. Parents' perceptions of the child

Most questions on interviews with the mothers and fathers were closed-ended and used a five-point scale. Since none of these measures showed a difference according to preschool care environment, all the results presented in this section are one-tailed comparisons of the MT and NMT groups. Only statistically significant results pertaining to the theoretically important segments from parent interviews are reported; among nonsignificant results, none were in a direction contrary to expectation.

5.2.2.1. Parents' orientation towards the child's education. Preparation for primary school. When asked about their children's preparation for primary school, 100% of the MT mothers, compared to 64.9% of the NMT mothers, believed that their children had been prepared for primary school ($\chi^2 = 35.12$, $P = .0001$) even though two-thirds of both groups of children had attended day care. MT mothers also believed that the preparation had been more helpful during the primary school years (4.27 vs. 3.67, $t = 3.22$, $df = 164$, $P = .001$). In addition, they were more likely to report that help with schoolwork for their children was available in their homes (89% vs. 76%, $\chi^2 = 4.37$, $P = .04$).

Educational expectations. Compared with NMT mothers, MT mothers reported higher expectations for their children's educational achievement (4.17 vs. 3.66, $t = 2.52$, $df = 146$, $P = .011$). Fathers from MT families also expressed higher expectations (4.59 vs. 4.03, $t = 2.33$, $df = 60$, $P = .023$), as well as more interest in "what is going on in the child's school" (3.19 vs. 2.84, $t = 2.08$, $df = 99$, $P = .02$).

Evaluation of academic performance. MT children were perceived by their fathers as more motivated to succeed in school, compared to NMT children (4.00 vs. 3.26, $t = 3.03$, $df = 98$, $P = .003$), and their mothers perceived their actual success as greater (3.54 vs. 3.32, $t = 1.8$, $df = 213$, $P = .04$).

5.2.2.2. Child's adjustment and family relations. Parent–child communication. MT mothers said they were better satisfied with their communication with their children and were also more likely to believe that they understand their children (see Table 11). In MT families, both

Table 11
Parent's perception of child and family relations

	MT		NMT				
	Mean	S.D.	Mean	S.D.	*t*	*df*	*P*
Mother indices							
Communication with child	14.33	1.60	13.50	2.08	3.11	215	.001
Family adjustment of child	28.78	3.32	27.69	4.28	1.95	215	.026
Woman's status	13.64	2.38	12.91	2.33	2.18	215	.015
Mother variables							
Is the child quarrelsome?	1.49	0.65	1.71	0.84	− 1.99	215	.025
Is the child sassy?	1.45	0.57	1.66	0.88	− 1.95	215	.026
Was the child spanked or beaten?	1.59	0.73	1.92	0.97	− 2.64	215	.004
Does the child talk about problems with mother?	3.54	0.72	3.17	0.91	3.16	215	.001
How well does the mother understand the child?	3.75	0.44	3.58	0.68	2.07	215	.02
How good are relations in the family?	4.35	0.61	4.08	0.75	2.80	215	.003
How close are family members?	4.46	0.63	4.22	0.88	2.11	215	.02
Father variables							
Was the child spanked or beaten?	1.17	0.38	1.62	0.72	− 3.38	98	.000
Does the child talk about problems with father?	2.91	1.04	2.48	1.03	2.02	98	.025

mothers and fathers are more likely to say that the child talks problems over with them (see Table 11).

Child's family adjustment. Eight items from the mother interview were combined into a single index of the child's family adjustment (Cronbach's $\alpha = .80$), and MT mothers had a higher assessment of the family adjustment of the child (Table 11). Specifically, MT mothers are less likely to perceive their child as sassy or talking back, or as quarrelsome, and both MT mothers and MT fathers are less likely to report that the child is disciplined by spanking or beating (see Table 11).

Women's status. An index was constructed from six items (Cronbach's $\alpha = .50$) related to the status of the woman in the family, particularly vis-à-vis her husband. Item content included communication, role-sharing, and decision-making between the spouses. On this index, MT mothers had significantly higher status (see Table 11).

General family relations. MT mothers rated relations in the family as being better than did NMT mothers, and the closeness of family members as being higher. MT mothers were also more likely to say that the child talks problems over with her and that she understands the child well.

The child's perception of the mother. The adolescent respondents were asked to try to recall their mothers' behavior towards them in various domains when they were small (Table 12). MT children were more likely to remember their mothers as liking to talk with them and as being interested in what they did. They were also more likely to remember their mothers as

Table 12
Adolescent's perception of mother

	Trained ($N=83$)		Not trained ($N=134$)				
Variables	Mean	S.D.	Mean	S.D.	t	P	N
Mother liked to talk with him when little	3.89	0.96	3.61	1.06	1.99	.025	215
Mother used to spank him when little	2.00	0.96	2.32	1.07	−2.25	.015	215
Mother used to console him when little	4.26	0.82	3.93	1.00	2.52	.005	215
Mother used to appreciate him when little	3.94	0.84	3.69	0.89	1.99	.025	215
Mother was interested in what he did	4.22	0.87	4.00	0.90	1.75	.040	214
Mother used to help him when little	4.20	0.79	4.00	0.91	1.69	.045	215

appreciating them, helping them, and consoling them when they were sad or upset, and less likely to remember their mothers spanking them.

5.2.2.3. Social integration and self-confidence of the child. Compared to the NMT group, MT adolescents gave responses indicating greater self-confidence in certain areas. Specifically, they were more likely to report that their ideas are accepted by their friends (3.74 vs. 3.54, $t=-2.06$, $df=215$, $P=.02$), and that they make their own decisions (3.54 vs. 3.32, $t=1.73$, $df=215$, $P=.45$). Children in the CUST group appear to be less confident than children from other preschool care contexts. For example, they rate themselves as less intelligent in comparison to their classmates [$F(2,214)=3.6776$, $P=.0269$].

MT mothers were more likely than NMT mothers to state that they approved of their child's friends (86% vs. 71%, $\chi^2=9.03$, $P=.03$).

Delinquency. Only eight children in the entire sample (3.7%) reported that they had had any trouble with the police, and all eight were from the NMT group. Six of them were from the CUST nursery group, and two were from the HOME group.

6. Discussion

The results of Study 1 (fourth-year findings) showed both interventions to be effective, particularly in cognitive outcomes. The children in the ED group showed a significantly superior performance on 23 measures and a positive but nonsignificant trend on 5. By contrast, the CUST group ranked better on only three measures, and the HOME group never outranked the other two. Likewise, the MT group was superior to the NMT group on 12 measures and showed a nonsignificant positive trend on 15. The NMT group did not have a more favorable outcome on any measure.

There was a small baseline difference between the MT and NMT groups in IQ, which was probably due to the attrition of some of the less competent and less motivated mothers from

the MT group. Nevertheless, comparisons of fourth-year measures with the first year baselines revealed that the differences produced by mother training are of a greater magnitude than the original differences (Fig. 1).

Study 2 results present something of a reversal in the long-term impact of the two interventions. More of the gains from mother training are sustained compared with those from educational day care. This is found to be the case for school attainment, school achievement, and academic orientation as well as for socioemotional development and social adjustment/integration. The progressively increasing gains from mother training were already apparent from the school grades of the older group of children in Study 1 and were clearer from Study 2 results.

Thus, despite the early lead of children from educational preschools in the first few years of school, there was no difference among the three environmental groups in terms of grades or school attainment by the end of the 5 years of primary school. Only in WISC-R vocabulary scores did the ED group score highest, followed by the CUST group. Even here the MT children in both CUST and HOME groups ranked higher than NMT children.

In all of the other measures, the mother training program was observed to produce better long-term results than the center-based educational day care program (ED). This is notable especially given the fact that the ED group started out with higher IQ scores in the first year. It appears that the mother training program provides a beneficial change in the mother herself, which consequently is reflected in her relation with her child and in the general atmosphere of the home. This contextual change helps to support the continued development of the child. In fact, as shown by the backward log linear analysis of posttreatment effects in school attainment, the support provided by the mother training extends beyond the intervention period. Thus, the long-term effects are not merely a continuation of the status of children when they leave the intervention, but rather, mothers appear to have some additional influence beyond simply maintaining fourth-year status in the years following intervention.

It is possible that, despite their clear superiority to the custodial day care centers, the educational nursery schools in this study may not have provided a sufficiently high level of enrichment to exert a great deal of long-term influence. However, the educational day care centers in the study were of a sufficiently good quality to have substantial short-term effects (Study 1). It is the difference between short- and long-term effects of educational day care that is problematic.

In any case, the likelihood of achieving very high quality in large numbers of preschools serving socioeconomically deprived children in developing countries is slim; only three preschools serving this population in Istanbul qualified as ‘‘educational’’ by our criteria and one of them was subsequently shut down. Thus, a more contextual intervention is called for, supporting the child’s proximal environment rather than depending completely on center-based care.

The relative ineffectiveness of custodial day care is a cause for concern. In too many cases, day care for the children of the poor, especially in developing countries, tends to be custodial. Study 2 results show that custodial care can be detrimental to children’s development. Adolescents with custodial care background had more grade retentions in school, perceived their parents and teachers to be less satisfied with their school performance, had lower self-esteem, and displayed more delinquency. The authoritarian-restrictive orientation common in

custodial centers (Bekman, 1993; Myers, 1992) is probably a factor here. Therefore, just "more day care" without proper attention to the quality of care is not a solution.

It is important to note here that parent-focused intervention helped to ameliorate the effects of custodial care in terms of academic achievement (see Fig. 2); CUST children who were in the MT group showed a trend toward higher primary school grades than those in the NMT group. The same is also true for ED children, indicating that mother training can even enhance the favorable effects on academic achievement of educationally oriented care.

The most striking finding is the sheer consistency of results showing the sustained positive effects of mother training. In virtually every area investigated, the favorable effects of mother training are evident. The NMT group did not show a more favorable outcome for any variable. This is remarkable, because there had been no contact with the families during the 7 years since the completion of the training program.

Since there were slight differences between the MT and NMT groups in baseline (first year) IQ scores, further analyses were performed to rule out the possibility that the long-term differences could be explained on this basis. The two main objective measures, school attainment and WISC-R vocabulary scores, were analyzed with baseline IQ as a covariate, with different results. School attainment was found not to be affected by baseline IQ, while vocabulary scores were more strongly related to IQ than to either mother training or early care environment. Since the vocabulary test was drawn from WISC-R, which is itself an IQ measure, the stronger correlation with baseline IQ is perhaps to be expected. However, the fact that mother training predicts school attainment, independent of both original IQ or early care environment, is probably the most important finding of the study.

The parent-focused approach reaches the child *through* the context and in the process changes not only the child but the proximal environment (as represented by the mother) as well. Thus, at the end of the intervention, children are not left in the same old context, but rather continue in a context which has changed along with them and thus can provide them with continued support. A second reason for the beneficial long-term effects of mother training is its emphasis on the overall development of the child — its focus on the "whole child" (Zigler & Berman, 1983). The mother training program promoted not only cognitive development, but also development of social skills, autonomy, and self-esteem.

The mother enrichment program, conducted in group discussions, aimed to improve mothers' communication skills in interacting with their children and with others, especially with spouses where many women had problems. The common pattern in such low-income, low-education groups is the subordination of women. In the MT group, there were gains in women's greater participation in decision-making, role sharing, and communication with their husbands. More effective communication with spouses appears to be a key factor. Long-term effects are seen in better family relations and greater well-being of mothers and children, as reflected in improved intrafamily status of the mothers vis-à-vis their husbands, approaching an egalitarian relationship between spouses and in higher self-esteem, greater autonomy, and better social adjustment of children. Also, MT teenagers remembered their mothers as being more interested in them, more helpful and comforting, and less physically punitive than the NMT group. It appears that the MT mother manifested a different style of parenting.

In return, both MT mothers and fathers were more satisfied with their children, had better communication and understanding between them, and reported less use of physical punishment. The more positive atmosphere reported by MT families was not limited to mother–child relationships; family relations in general and closeness of family members were both rated higher by MT than by NMT mothers. The tendency of MT mothers to have more say in family affairs, thus to enjoy higher intrafamily status, which may derive from the interpersonal communication skills they acquired through their training, apparently contributed to better family relationships and consequently, to their greater satisfaction with these relationships.

The more positive approach of the parents towards communication with and discipline of the child in the MT group is likely to be the operative variable in fostering greater self-confidence in the children. Indeed, the tendency of MT children to believe that their ideas are better accepted by their friends and that they make their own decisions points to an augmented self-esteem in this group. The fact that MT mothers are more likely than NMT mothers to approve of their child's friends is consonant with both the better communication in the MT family and the youngster's greater social self-confidence.

In low-income contexts in developing countries, access to continued education is the road to social mobility, and primary school achievement is an important determinant of whether a child will stay in school or leave education for work. The fact that more of the MT, compared with the NMT group, were still in school beyond compulsory primary school is arguably the greatest success of the mother training program. The fact that the two groups do not differ in school achievement beyond primary school is explainable by a self-selection factor with more children from the NMT group dropping out and only the more successful ones remaining in school. Thus, continued school enrollment may be a better indicator of academic achievement than grades for this population.

Some positive disposition on the part of the mothers toward the project might have influenced their responses even after 7 years. However, this could not have been a factor for the fathers and the children, who had not been directly targeted by the project intervention. Thus, the convergence of fathers' and children's independent responses with those of mothers may be considered evidence for real changes in the experimental group over time.

It is to be noted that both mothers and fathers in MT families reported higher expectations for their children's educational achievement than parents in NMT families, and fathers from MT families also expressed more interest in what is going on at the child's school. Higher parental expectations and enhanced interest are undoubtedly related to the MT children's higher level of school attainment. Given the groups' similar education and SES levels to start out with, these differences are, to a large extent, attributable to the effects of mother training.

6.1. Conclusion and policy implications

A number of characteristics of TEEP can be singled out as essential ingredients of effective interventions (Kagitcibasi, 1997b). These are the whole child approach; the contextual approach; multiple targets and multiple goals; empowerment; sharing goals with the participants (mothers); optimal timing; and cost effectiveness. Mother training has had long-term effects because it focused on the overall development of the child as well as the

well-being of the mother and the family through empowering the key person, the mother, for multiple positive outcomes. With sustained gains for children, mothers, and families, the investment becomes cost-effective and thus, applicable on a wide scale.[3]

Several reviews (Farran, 1990; Home visiting, 1999; Ramey & Ramey, 1998; Wasik, Bryant, et al., 1990) question the effectiveness of home-based, mainly home visiting, intervention, so there is a need to identify the aspects of TEEP that make it different from most "home-based" programs. First, TEEP is not merely a "home visiting" or even purely a "home-based" program. Half of the cognitive and all of the mother enrichment program took place in biweekly group discussions, utilizing the facilitating effects of groups which served an important function in changing parenting attitudes and behaviors.[4] Women's groups are also culturally appropriate (Kagitcibasi, 1996). This may be the case in other contexts, also, as for example pointed out by Slaughter (1983) for Black women in the US.

Secondly, home-based programs reviewed in the literature tend to have either an educational or a parent support goal (Seitz, 1990). TEEP integrates these two goals and thus accomplishes both goals. As Yoshikawa (1994) notes in a review of 22 programs, those which combine early childhood education with family support are the most effective in the long run. TEEP combined a child-focused (early education) approach with a parent-focused approach by targeting both the child and the mother.

Finally, the quality of implementation is of crucial importance in explaining the success of TEEP. The group leaders (local coordinators) were directly trained on a continuous basis throughout the 2 years by the research team and can be considered professionals. As pointed out in the literature (e.g., Olds & Kitzman, 1993), the training and professional competence of trainers contribute to their effectiveness. The mothers' aides were, in turn, closely supervised and supported by the group leaders. The student assistants also helped support the trainers in many ways. This teamwork helped motivate both the trainers and the mothers, as also did direct appreciation of their work.[5] Thus, there was a high level of participation and very low absenteeism, as contrasted, for example, with the ineffective HIPPY applications in the Netherlands (Eldering & Vedder, 1993) and in the USA, as well as other home-visiting programs (Home visiting, 1999). Participants in TEEP shared its goals which also contributed to its effectiveness, another point stressed in the literature (e.g., Wasik, Ramey, Bryant, &

[3] In fact, a program based on TEEP — the Mother–Child Education Program (MOCEP) — is currently being implemented in 60 provinces in Turkey through the joint efforts of the Mother–Child Education Foundation and the Turkish Ministry of Education, with World Bank support. The main difference from TEEP is a new cognitive program, which replaced HIPPY, and the 1-year, rather than 2-year implementation before primary school entry. It has reached some 60,000 individuals. Evaluation research indicates very promising results (Aksu-Koc & Kuscul, 1994; Aycicegi, 1993; Bekman, 1998a; Ercan, 1993). MOCEP has also influenced educational policy in the sense that home–community-based nonformal early childhood education is now being accepted as a cost-effective model of preschool education by the Turkish Ministry of Education alongside the center-based model. MOCEP is also being applied to Turkish immigrant populations in some European countries.

[4] In the current MOCEP applications all over the country and in Europe mother training takes place in groups in community centers, with no home visiting. This change has decreased costs and increased effectiveness.

[5] For example, in the form of certificates and "graduation" ceremonies, as well as recognizing the fathers, through regular communications, for allowing their wives' participation, motivating aspects are also present in the current applications of MOCEP.

Sparling, 1990), which contrasts with the "recipient" and subordinate role sometimes imposed on the mothers in individual home visiting, to the detriment of the effectiveness of the intervention (Ball, 1994).

Some aspects of the families might have also been positive factors. Almost all of them were two parent families, and the mothers were older (mean age: 29). This situation contrasts with the intervention literature, especially in the US, with poverty populations including substantial numbers of young and single mothers.

The policy implications of TEEP point in certain directions. In socioeconomically disadvantaged contexts, particularly in developing countries, where home environments do not provide children with adequate support for optimal development, parent education to improve these environments may be crucial for long-term developmental results. Changing the home environment together with the child can provide sustained positive gains with also possible horizontal effects (extending to younger siblings and to other family/kin). Thus, this strategy tends to be cost-effective (Bekman, 1998a, 1998b; Myers, 1992).

In contrast, in socioeconomic contexts where homes provide enriched environments for young children, center-based preschool education focused on the child alone can produce results. Thus, Andersson (1992) found positive long-term effects of early entry to center-based care in Sweden. However, in such contexts, there tends to be a confounding of positive effects coming from the home and from center-based education (Scarr, 1998).

The above policy implications are compatible with the results of successful programs that show long-term effects from center-based interventions that include parental involvement. Thus, Zigler and Styfco (1994) note that successful programs, even if they begin by focusing directly on children, evolve into programs affecting two and even three generations. It is important to note, however, that the contextual orientation espoused here does not refer to a weak level of parent involvement, as, for example, seen in some watered-down, occasional "home-visit" programs. What is being proposed here is a full-fledged early enrichment/education program directly targeting the child's overall development *together with* and *through the mediation* of parent education, as seen in TEEP (Kagitcibasi, 1997a, 1997b). It is this combination which promises to promote long-term, multifaceted development.

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