

The Parents as Teachers Program: Results from Two Demonstrations

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Abstract

The Parents as Teachers (PAT) program is a parent-education program that includes home visiting and is designed to begin prenatally or at birth. Through home visits, visitors called parent educators help parents to strengthen their parenting skills and knowledge of child development and to prepare young children for school. This article describes the PAT program and reports the results of evaluations of two randomized trials of PAT: (1) the Northern California (Salinas Valley) Parents as Teachers Demonstration, which served primarily Latino parents in the Salinas Valley of California's Monterey County; and (2) the Teen Parents as Teachers Demonstration, which served adolescent parents in four counties in Southern California.

The two evaluations revealed small and inconsistent positive effects on parent knowledge, attitudes, and behavior, and no gains in child development or health, when analyses compared the experimental and control groups overall. However, subgroup analyses in the Salinas Valley program indicated that children in primarily Spanish-speaking Latino families benefitted more than either non-Latino or English-speaking Latino families, with significant gains in cognitive, communication, social, and self-help development. Subgroup analyses in the Teen PAT Demonstration indicated that families that received both PAT services and comprehensive case management services designed to help mothers improve their life course benefitted most. Subgroup analyses in the Salinas Valley study suggested that children in families that received more intensive services benefitted more than children whose families received less intensive services. Results from that study suggested that home visits produced about a one-month developmental advantage per 10 visits for participating children.

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Home visiting has broad appeal as a delivery mechanism for providing many kinds of child and family services. Visiting families in their homes can give visitors a holistic view of each child and family, which can help the visitors tailor services to meet family needs. Home visits also can accommodate families' schedules, encouraging the participation of families that might be unable to attend programs with more structured and less individualized schedules. The Parents as Teachers (PAT) program is an example of a widely implemented, universal-access home visiting program

that emphasizes positive parenting behavior as the vehicle to achieve developmental benefits for children. Major goals of PAT include increasing parents' knowledge of child development, preparing young children for success in school, and increasing parents' feelings of competence and confidence.¹

To achieve its goals, the PAT program uses individual, home-based instruction and group interactions to inform parents about principles of child development and good parenting practices. Trained and certified parent educators use a standard curriculum in the home visits, which can begin prenatally. The curriculum emphasizes different developmental stages through the first three years of life. Additional curricular materials (developed after the demonstration projects described in this article were begun) meet the particular needs of parents of three- to five-year-olds, parents who are teenagers, and parents whose children attend child care centers. Improved knowledge is expected to help parents feel competent in their roles and to provide the environments and personal interactions with their children that will support positive child development. Healthy, well-developed children who are ready for school are the ultimate intended result.

PAT has enjoyed wide implementation and rapid growth. Begun in Missouri in 1981, the program has expanded to serve more than 500,000 families in more than 2,000 sites in 49 states and six foreign countries.² (See Appendix B in this journal issue for an additional description of PAT.) In addition to the general appeal of home visiting as a service approach, the popularity of PAT is due in part to the inherent attractiveness of its basic premises: "that babies are born learning and that parents are their first and most influential teachers."³ Also, the use of parent educators with a wide range of backgrounds and the provision of, for the most part, monthly services make PAT a relatively inexpensive program model to implement⁴ compared with interventions that rely on nurses⁵ or that have center-based, child-focused components in broader two-generation program models.⁶

In 1990, the California legislature provided statutory authorization for a grant program to implement PAT in selected counties in the state,⁷ and articulated the specific intention that it should be targeted to families with parents who had limited English proficiency and to those with parents who were teenagers. Although quasi-experimental studies of PAT in Missouri had indicated benefits for children, the effectiveness of PAT for these particular groups had not been demonstrated. (See Appendix B in this journal issue for a description of other research studies concerning PAT.) Two research studies were launched to evaluate PAT's effectiveness with these populations: the Northern California (Salinas Valley) PAT Demonstration, which focused on Latino families; and the Teen PAT Demonstration.⁸ Evaluations of both demonstrations were conducted by SRI International.

These demonstrations were designed to specifically address the question of targeting PAT to limited English proficient and teen parent families, and also to overcome general weaknesses in the research base of PAT. An expert panel⁹ called together to review PAT and related research¹⁰ identified the

following limitations to the research base and corresponding future research needs:

■ **More rigorous research designs.** Much of what is known about PAT results from quasi-experimental research¹¹ and research with small samples,¹² a state of research common to the home visiting arena more broadly.¹³ Given PAT's expansion, experimentally based results are needed to have the required credibility to influence the national policy arena.

■ **Research regarding PAT's effectiveness for low-income, minority, and at-risk families.** Many of the studies of PAT's effectiveness have been conducted with working- or middle-class white families and/or in nonurban areas.¹⁴ Although generally positive, these results do not provide evidence of PAT's effectiveness for low-income and minority families or for those at risk of poor outcomes. Addressing this gap in the knowledge base regarding PAT overlaps well with determining whether targeting PAT to teen parents and those with limited English proficiency is warranted by its effectiveness with those groups.

■ **Research regarding the dimensions of program effectiveness.** Replicating effective program dimensions requires understanding what it is about the programs that works. Are there thresholds of service intensity that must be met for programs to be effective? To what extent does impact relate to staff characteristics, quality, and training? The expert panel identified the need to illuminate the "black box" of the PAT program so that the contribution of its various elements is understood.

This article reports the results of the Salinas Valley PAT and Teen PAT Demonstrations. Each of the demonstrations is described, including a review of the program model, enrolled families, and the extent to which families were lost to the demonstrations through attrition. Then findings for the full sample of families in each demonstration are presented. Following this is a discussion of the effectiveness of targeting parents with limited English proficiency, using data from the Salinas Valley PAT Demonstration to focus explicitly on results for families with Latina mothers and distinguishing those who spoke primarily Spanish from those who were primarily English speakers or bilingual. Finally, variations in exposure to PAT among enrolled families and the relationship of these variations to outcomes for parents and children are considered.

Program Descriptions

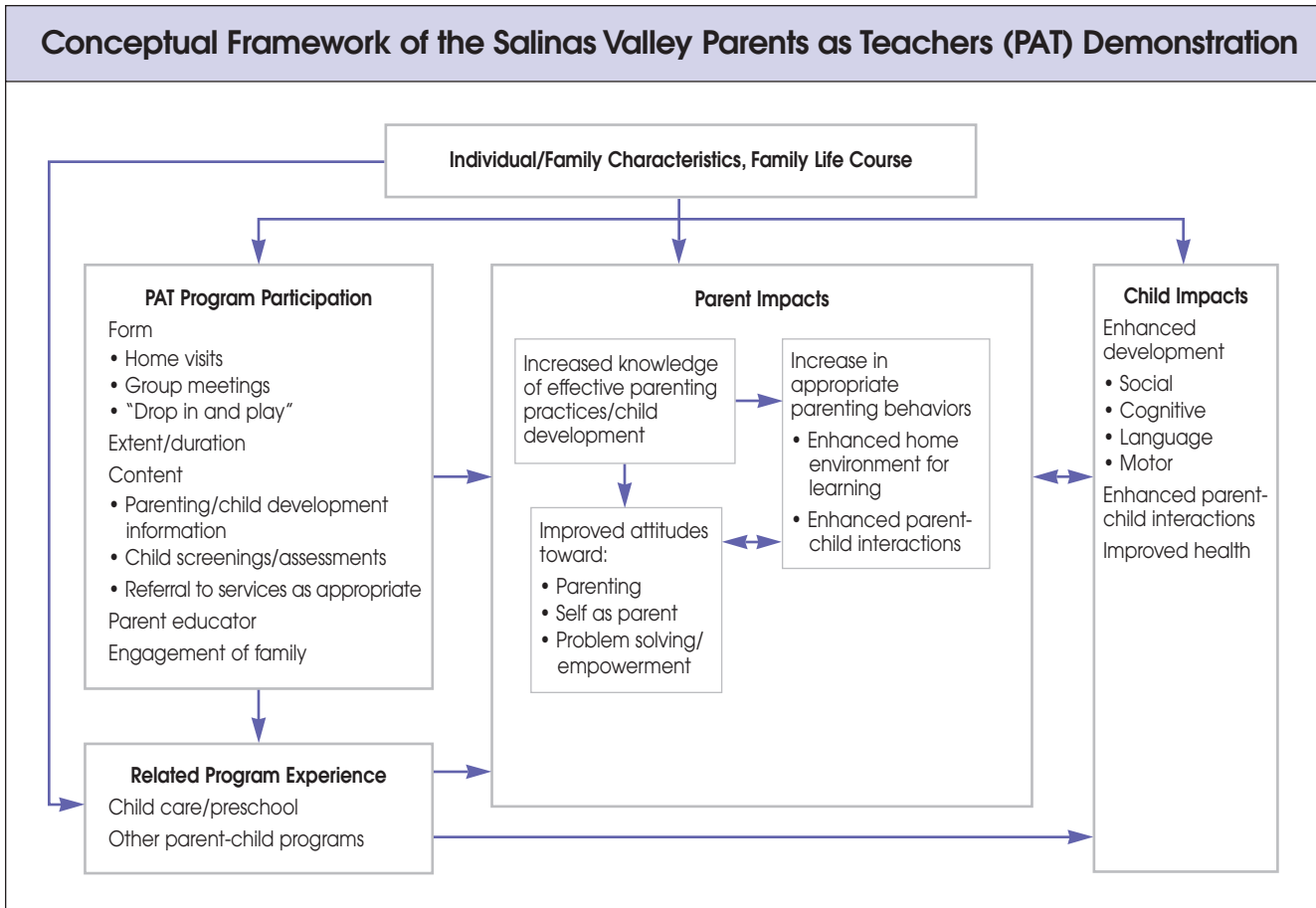
The Northern California (Salinas Valley) Parents as Teachers Demonstration

A consortium of school districts¹⁵ sponsored implementation of the PAT program in the Salinas Valley of California, beginning with a two-year pilot phase in 1990,¹⁶ continuing with the launching of the randomized trial proper in 1992, and concluding with the

"graduation" of participating families in 1996, when children reached their third birthdays.¹⁷

The Salinas Valley, in north Monterey County, is a largely agricultural area with a high demand for seasonal farm labor and a predominantly Latino population. The unemployment rate in the county at the time of the demonstration was among the highest in the state—15.1% in March 1995, compared with 7.8% for the state as a whole.¹⁸

Figure 1



Source: Wagner, M., Clayton, S., Gerlach-Downie, S., and McElroy, M. *An evaluation of the Northern California Parents as Teachers Demonstration: Review draft*. Menlo Park, CA: SRI International, 1997, p. 1-6.

The conceptual framework for the Northern California (Salinas Valley) Parents as Teachers (or Salinas Valley PAT) Demonstration and evaluation, illustrated in Figure 1, includes the key parent and child outcomes expected from the program and reflects the underlying assumption of the program: that participation in PAT services will change parent behavior and thereby enhance children's development.

Families with children no older than six months were recruited to the demonstration by local program staff over a one-year period. Recruitment sites included the local Women, Infants, and Children (WIC) office; medical clinics; and school districts. During the pilot phase, attrition from the PAT group had been higher than attrition from the control group. Therefore, to ensure sufficient numbers of families in each group at the end of the study, SRI staff randomly assigned 497 families to the participant and control groups, with a 60% probability of assignment

to the participant group (n=298) and a 40% probability of assignment to the control group (n=199).¹⁹ There were no statistically significant differences between the participant and control groups at enrollment, as shown in Table 1, or at any assessment point.¹⁹

These families reflected their community. A large majority of families had Latina mothers, many of whom spoke primarily Spanish. Many families were low income, with about one in five receiving Aid to Families with Dependent Children (AFDC) benefits and more than half covered by Medi-Cal. Nearly half of the families were headed by unmarried mothers.

Program Services

The PAT group was offered monthly home visits for as long as the families chose to remain in the program, up to the children's third birthdays. Each home visit, conducted by a trained parent educator, covered a lesson from the national PAT curriculum. All of the

Table 1

Mothers' Characteristics at Enrollment in Parents as Teachers (PAT), by Group						
Characteristics	Salinas Valley PAT		Teen PAT			
	PAT	Control Group	PAT	Control Group	Case Management	Combined Intervention
Average Age	25.3	25.9	16.6	16.8	16.6	16.6
Ethnic/Language Background^a						
Latina	83.6%	76.9%	57.1%	55.1%	52.6%	59.4%
Caucasian ^b	16.5%	23.1%	20.3%	19.1%	25.4%	18.3%
African American	—	—	18.1%	24.2%	17.9%	21.1%
Other	—	—	4.5%	1.7%	4.0%	1.1%
Spoke mostly Spanish	45.7%	44.5%	20.9%	21.9%	19.6%	21.1%
Economic Status						
Received AFDC	20.5%	20.6%	32.2%	36.5%	27.6%	29.2%
Participated in Medi-Cal	61.7%	59.3%	—	—	—	—
Worked or was in job training	24.5%	22.1%	5.1%	11.2%	9.8%	9.8%
Percentage Who Were Enrolled in or Had Completed High School	41.6%	41.7%	65.3% ^c	75.3%	70.5%	67.4%
Household Composition						
Married	56.0%	58.3%	16.6%	11.2%	9.9%	12.0%
Only adult in household	10.1%	12.1%	1.7%	0.6%	1.2%	1.1%
Percentage Who Enrolled While Pregnant	49.8%	46.9%	57.6%	55.6%	52.6%	59.4%
Percentage Who Reported Knowing "A Lot" About Infants	14.9%	9.1%	32.4%	27.5%	25.3%	31.6%
Sample size	298	199	177	178	174	175

^a Percentages may not total 100% due to rounding.
^b In the Salinas Valley PAT study, this category included all non-Latina mothers, the majority of whom were Caucasian.
^c Statistically significant difference from the control group in a two-tailed test at the p<.05 level.

10 parent educators who worked in the program during the course of the demonstration project had at least some college education; six had bachelor's degrees or better. Six were Latinas who spoke both English and Spanish.

Mothers were the primary program participants, occasionally joined by other family members. The enrolled children were included in the visits so the parent educators could model appropriate ways of interacting with the children. At the close of the lessons, the parent educators often left materials that reinforced or supplemented the lessons for the parents to read and share with other family members. Parent educators also conducted periodic screenings of children's hearing, vision, and general development, and made referrals to community services—for example, for child care, health care, and

family crisis interventions such as counseling or battered women's shelters.

PAT program participants received an average of 20 visits over three years. Visits were planned to last from 45 to 60 minutes, but a sample of home visits that were videotaped ranged in length from 28 to 50 minutes depending on the parent educator.²⁰ Voluntary group meetings in English and Spanish were offered periodically by parent educators, during which parents discussed issues with and received social support from the parent educators and other parents. However, less than 15% of participant group families attended any group meeting.

Control Group Services

The evaluation team periodically sent age-appropriate toys to the control group as a

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method of tracking their location and encouraging participation in the assessments. If annual assessments conducted for the purpose of the evaluation revealed significant developmental delays or other problems, families were referred to appropriate services. Other than that, the only services control group families received were those that they sought on their own from existing community health and human services providers.

Assessments of (1) parent knowledge, attitudes, and behavior; (2) child development; and (3) the conduciveness of the home environment to promoting child development were conducted in families' homes at children's first, second, and third birthdays by SRI field evaluators who were hired, trained, and supervised by SRI and were unaware of the group assignments of the families they assessed. In addition, families were invited to bring their children on a voluntary basis to the Monterey County Office of Education for annual developmental assessments by child psychologists using the Bayley Scales of Infant Development (BSID).²¹

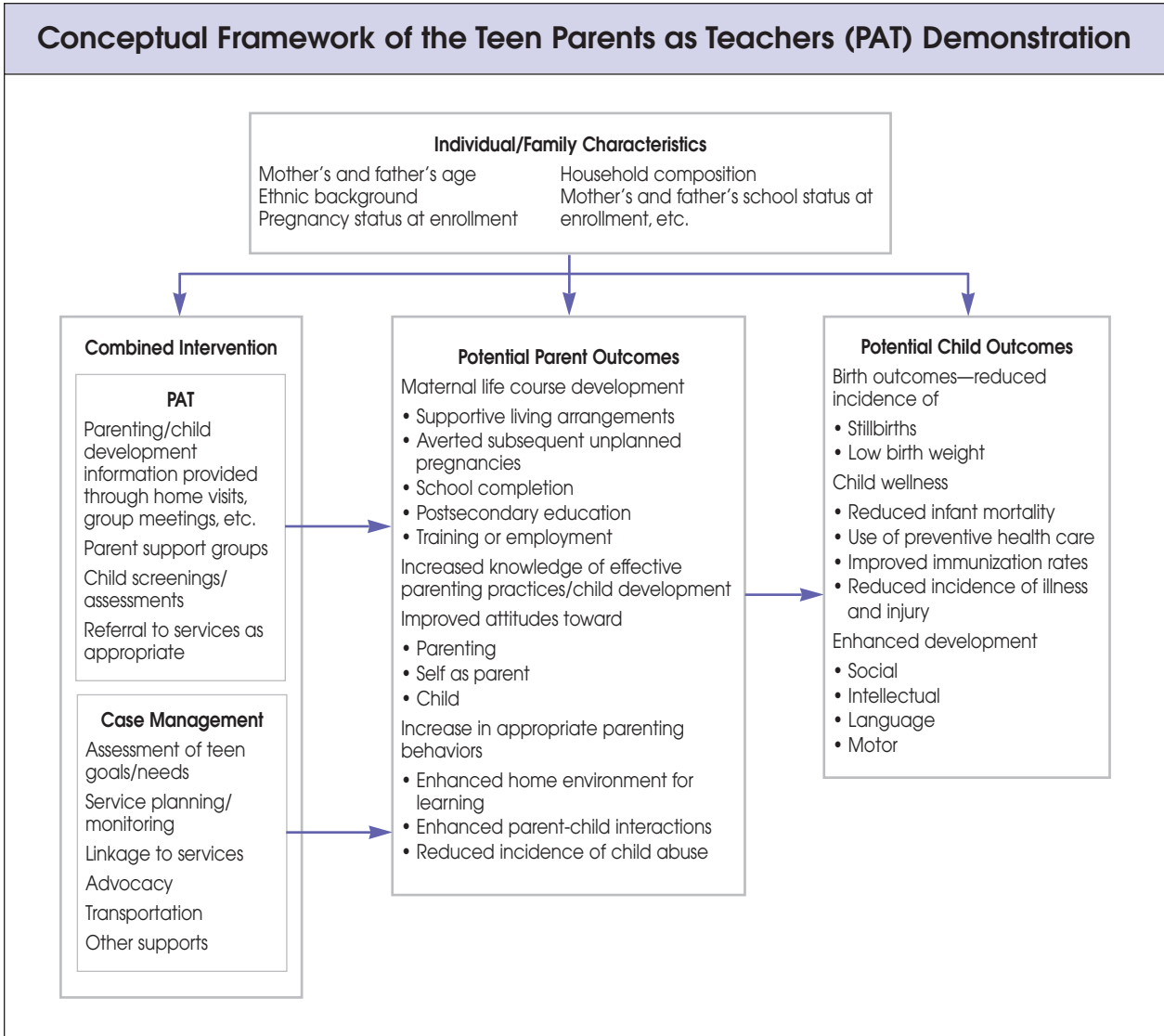
The Teen Parents as Teachers Demonstration

The Teen PAT Demonstration was sponsored by a public-private partnership initiated in 1991.²² The conceptual model for Teen PAT is illustrated in Figure 2. Designed to test the effects of a two-generation approach to social service delivery to families

and children, the program combined PAT services with comprehensive case management services for the participating teen parents to produce positive life changes for both parents and children. Both a case manager and a PAT parent educator served each family in this "combined intervention." Case management activities focused on achieving positive outcomes in the teen mothers' lives, particularly related to education and postponed repeat childbearing. (See the article by St.Pierre and Layzer in this journal issue for a discussion of another two-generation program.) Because the effectiveness of the individual interventions for teens was unknown, the demonstration also included stand-alone PAT and case management intervention groups.

Teen PAT Demonstration sites in Los Angeles, San Bernardino, San Diego, and Santa Barbara Counties were selected through a competitive bid process. Applicants were agencies with established programs of case management for teen parents and the willingness to recruit and randomly assign up to 200 teens over the course of a year to one of four experimental conditions. Agencies also were responsible for the hiring and supervision of PAT-trained parent educators. The sponsoring agencies at the sites differed (for example, three were youth-serving organizations, whereas one was a partnership between a public health department and the YWCA), as did the communities they served (for example, the largely African-American neighborhood of South

Figure 2



Source: Wagner, M., Cameto, R., and Gerlach-Downie, S. *Intervention in support of adolescent parents and their children: A final report on the Teen Parents as Teachers Demonstration*. Menlo Park, CA: SRI International, 1996, p. 1-4.

Central Los Angeles and largely Latino areas in Santa Barbara).

Like the Salinas Valley PAT Demonstration, the evaluation of the Teen PAT Demonstration used a randomized experimental design.²³ Teens were eligible if they were less than 19 years of age and either were pregnant or had babies who were less than six months of age. SRI randomly assigned eligible participants, recruited over a one-year period from the population of youths served by the program agencies, into four groups: (1) PAT program services alone (n=177), (2) case management services alone (n=174), (3) PAT services plus case management (the two-generation group) (n=175), and (4) an untreated control

group (n=178). Table 1 illustrates that the groups were equivalent at enrollment, with the exception that mothers in the PAT-alone group were significantly more likely than control group mothers to have dropped out of high school.

As Table 1 describes, the 704 enrolled Teen PAT families were fairly diverse ethnically and sociodemographically. About half of the mothers were Latina, with the remainder being fairly evenly divided between African American and Caucasian. Mothers were between 15 and 18 years of age at enrollment, and the majority were enrolled in or had completed high school. Few mothers were married. Almost one-third of families received AFDC benefits.

Program Services

The PAT and combined intervention groups were offered monthly home visits and PAT group meetings through the children's second birthdays.²⁴ During these visits, as in Salinas Valley, trained parent educators covered lessons from the national PAT curriculum. On average, participants received 10 visits during the two-year period. Visits were planned to last about one hour, but data regarding the actual length of visits were not collected. Participant attendance at group meetings was low, averaging two meetings for PAT group members and three meetings for members of the combined intervention group over two years.

The case management and combined intervention groups were offered comprehensive case management services modeled after those provided through California's Adolescent Family Life Program, with face-to-face contacts provided as often as teens

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needed but at least quarterly. Case managers provided referrals or arranged for services to address issues such as psychological functioning, health status, nutrition, environmental risks, and educational and vocational goals.

In the combined intervention group, the case management contacts, which could occur at home or elsewhere, were separate from the PAT program visits. On average, participants in the case management and combined intervention groups received 10 case management contacts in two years. This means that a teen mother in the combined intervention group received an average of 20 in-person contacts from both PAT and case management staff during the course of the program. Additional telephone contacts with the teens averaged 6 for the PAT group, 8 for the case management group, and 17 for the combined intervention group.

Control Group Services

As in the Salinas Valley study, the control group received toys as an incentive to maintain contact with the program, and participated in annual developmental assessments, but otherwise received only the services that were normally available in the communities and that they sought at their own initiative. Children and parents were assessed by SRI field evaluators in their homes at or around the children's first and second birthdays.

Attrition from the Demonstrations

Attrition from the participant groups of both programs was high: 43% in Salinas Valley PAT over three years and an average of 57% for the three Teen PAT interventions over two years (58% in the PAT group, 63% in the case management group, and 52% in the combined intervention group). The evaluation components of both demonstrations, however, had extensive procedures for tracking families whether or not they continued their participation in the programs. In addition, a monetary incentive was paid to families for completing each in-home assessment.

Using these procedures, evaluation assessments were successfully completed at the children's third birthdays for almost 73% of the original sample in the Salinas Valley PAT Demonstration, including 70% of participant and 77% of control group members. Comprehensive analysis of the characteristics of families that remained in the program and the evaluation study revealed no significant differences from the original sample in terms of mothers' and fathers' age, ethnicity, or education; household composition or economic status; child characteristics; or mothers' previous experience with infants.

Attrition was much higher in the Teen PAT Demonstration evaluation. Data were collected for only 52% of the original Teen PAT families (51% of each intervention group and 54% of control group teens), despite the fact that families were followed only through children's second birthdays. This higher attrition among teen parents reflects the general instability of teen populations in these communities and the challenge of retaining them in both program

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services and the evaluation study. However, despite the high attrition rate, there were no significant differences between the teen parents who were retained in the program and evaluation study and the original sample in terms of the characteristics listed above. In both demonstrations, moving from the community was the most common reason for attrition, accounting for 52% of Salinas Valley PAT participant dropouts and an average of 22% of Teen PAT participant dropouts across the three intervention groups.

Outcomes Measurement Overview

The two demonstrations had many outcomes of interest in common, including those focused on child development and parenting knowledge, attitudes, and behaviors. In the Teen PAT Demonstration, the program's affiliation with the California Office of Child Abuse Prevention enabled access to child abuse data that was not possible in Salinas Valley PAT.²⁵ Outcomes were measured with the following instruments:

- *Parenting knowledge*—the percentage of items that were answered correctly on the 57-item Knowledge of Infant Development Inventory (KIDI).²⁶

- *Parent attitudes*—the Parenting Sense of Competence (PSOC) Scale,²⁷ a self-administered attitude inventory. Both the total score and two subscale scores regarding parental efficacy and satisfaction are reported.

- *Parenting behaviors*—the Home Observation for Measurement of the Environment (HOME) Inventory²⁸ for families of children ages birth to three, which assesses parenting practices using the following subscales: acceptance of child's behavior, opportunity for stimulation, organization of the environment, parental involvement, parental responsiveness, and appropriate play materials. The HOME is based on parent reports and field evaluator observations.

- *Child development*—the Developmental Profile II (DPII)²⁹ cognitive, communication, social development, self-help, and physical development scales were used to assess these outcomes in both demonstrations. The DPII is based on parent reports and field evaluator observations. The Salinas Valley PAT study also used direct assessments by trained testers of children's development: the BSID mental and physical development subscales³⁰ at ages one, two, and three years and the Peabody Picture Vocabulary Test (PPVT) at age three.³¹

- *Child health and health care*—the children's immunization histories were recorded from the yellow cards issued to parents by health care providers in California as a record of immunization types and dates. Use of health care services was assessed through annual interviews with parents. In the Teen PAT study, information about whether child abuse or neglect complaints had been filed with the child protective services agencies in the four participating

counties was obtained from those agencies with the help of one of the funding agencies, the California Office of Child Abuse Prevention.

All instruments that could be self-administered by parents were offered in English and Spanish; they were either read and completed by respondents or read aloud by field evaluators who recorded responses.

In addition to these measures of outcomes, demographic information was collected by program staff at the time parents were enrolled. To assess actual exposure to the interventions, implementing agencies recorded the number of contacts of different types (home visits, telephone contacts, group meetings, and referrals) with each family during the demonstrations.

Program Evaluation Results

The evaluation results of the Salinas Valley and Teen PAT programs suggest that, when comparing PAT or PAT-plus-case-management groups with control groups,

terms of parenting behavior, although the combined intervention group of the Teen PAT Demonstration had a positive and significant impact on the HOME subscale that measures acceptance of children's behavior, a negative effect of similar magnitude was noted on that same subscale in the Salinas Valley PAT group (in other words, the control group outperformed the PAT group on that subscale). The only other notable program effect, reflecting the availability of appropriate play materials in the PAT intervention group of the Teen PAT program, also was negative.³³

Child Outcomes

Given that changes in parenting knowledge, attitudes, and behaviors were the means by which improvements in child health and development were expected to occur, these small and inconsistent parenting outcomes would argue against seeing any systematic positive program benefits for children. However, Table 3 shows that small to moderate program benefits were found for some aspects of child development.

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PAT had little effect on parenting knowledge, attitudes, or behaviors as measured in these demonstrations. Nor were significant effects noted on child health or health care. There is some evidence, however, that PAT improved children's cognitive development and perhaps their social and self-help development. The following section describes the major program evaluation results.³²

Parent Knowledge, Attitudes, and Behavior, and the Home Environment

Despite the fact that increasing parents' understanding of parenting and child development was the main focus of PAT home visits, Table 2 shows that no benefit emerged in terms of parenting knowledge for the full sample in either program. Changes in parenting attitudes also were small and inconsistent in direction. In

PAT children in the Salinas Valley program benefitted significantly in the area of self-help development, advancing by approximately two months over the control group. Although not statistically significant, small positive effects on social development were noted for the children in the PAT groups in both studies. In Teen PAT, the children in the combined PAT-and-case-management group experienced statistically significant gains of one or more months over the control group in cognitive development, but the children in the PAT group experienced no significant benefits in cognitive development.

In terms of child health and health care, no significant benefits were associated with PAT alone in either demonstration. In Teen PAT, the combined PAT-plus-case-management intervention was associated with significantly fewer opened cases of child abuse or neglect,³⁴ and the case management intervention was associated with a significantly higher rate of full immunization.

More Detailed Analysis of Results Reveals Program Benefits

Multivariate analyses were conducted to further explore the impact of the PAT program. Such analyses permitted researchers

Table 2

Parenting Knowledge, Attitudes, and Behaviors Results for Parents as Teachers (PAT) Participant and Control Groups						
Results	Salinas Valley PAT		Teen PAT			
	PAT ^a	Control Group	PAT ^a	Control Group	Case Management ^c	Combined Intervention ^c
Parenting Knowledge						
Average percentage of Knowledge of Infant Development Inventory (KIDI) parent knowledge items answered correctly	66.4% (-0.18)	68.8%	64.5% (0.05)	63.8%	63.1% (-0.05)	63.7% (0.00)
Parenting Attitudes						
Total parental attitude scale	52.4 (-0.06)	52.9	53.3 (0.17)	52.1	52.8 (0.11)	52.8 (0.10)
Parent satisfaction subscale	25.4 (-0.18)	26.4	25.5 (0.14)	24.7	25.4 (0.12)	25.6 (0.15)
Parent efficacy subscale	27.1 (0.15)	26.6	27.8 (0.14)	27.4	27.4 (0.00)	27.3 (-0.03)
Parenting Behaviors/Home Environment						
Total Home Observation for Measurement of the Environment (HOME) scale	36.2 (-0.02)	36.4	38.0 (-0.10)	38.4	38.7 (0.05)	38.8 (0.08)
Acceptance of child's behavior subscale	6.4^b (-0.28)	6.7	6.4 (0.11)	6.2	6.4 (0.11)	6.6^b (0.30)
Opportunity for stimulation subscale	3.4 (-0.07)	3.5	4.0 (0.19)	3.7	3.7 (0.01)	4.0 (0.25)
Organization of the environment subscale	5.7 (0.08)	5.7	5.7 (-0.12)	5.7	5.8 (0.24)	5.8 (0.10)
Parental involvement subscale	4.0 (0.01)	4.0	4.7 (-0.13)	4.9	5.1 (0.16)	4.8 (-0.09)
Parental responsivity subscale	9.9 (0.04)	9.8	9.8 (-0.04)	9.9	9.8 (-0.02)	9.7 (-0.07)
Appropriate play materials subscale	6.7 (0.00)	6.7	7.5^b (-0.35)	8.0	7.9 (-0.10)	7.9 (-0.05)
Sample size	202	148	90	96	88	89

^a Effect sizes are in parentheses. See note no. 32 at the end of this article for a discussion of effect sizes.
^b Statistically significant difference from the control group in a one-tailed test at the p<.05 level.

to control statistically for some of the possible effects of individual, family, and household characteristics, such as age, language, and income, that might affect the outcomes, either by creating spurious differences between the PAT and control groups or by hiding real differences that might be present. Ideally, of course, random assignment would equalize the groups at the outset, and equivalence would be maintained over time, such that statistical controls would not be necessary. But, as mentioned above, the groups did differ at the outset on a few characteristics, and this

form of analysis provides an additional exploration of the data.

Multivariate analyses were conducted for each parent and child outcome. For Salinas Valley PAT, characteristics held constant in the multivariate analysis were mother's education, age, ethnicity, primary language, and self-reported experience with infants at enrollment; household income; child's gender; divorce during the course of the demonstration project (which, as reported later, may have had a disturbing effect on children's development);

Table 3

Child Development and Health Outcomes for Parents as Teachers (PAT) Participant and Control Groups						
Outcomes	Salinas Valley PAT		Teen PAT			
	PAT ^a	Control Group	PAT ^a	Control Group	Case Management ^a	Combined Intervention ^a
Cognitive Development						
Developmental Profile II (DPII) scale score	-0.5 (0.10)	-1.1	2.4 (0.04)	2.2	3.5^{b,c} (0.32)	3.4^c (0.26)
Bayley Scales of Infant Development (BSID) mental development index	90.8 (-0.06)	91.6	NA	NA	NA	NA
Communication Development						
DPII months differential ^d	5.4 (0.01)	5.3	3.3 (0.05)	3.0	3.4 (0.07)	3.4 (0.06)
Peabody Picture Vocabulary Test (PPVT) months differential ^d	0.3 (0.06)	-0.2	NA	NA	NA	NA
Social Development						
DPII months differential	7.4 (0.17)	5.9	7.8 (0.14)	6.8	8.0 (0.16)	7.4 (0.08)
Self-Help Development						
DPII months differential	13.0^c (0.25)	10.8	8.9 (-0.10)	9.5	9.9 (0.05)	9.1 (-0.06)
Physical Development						
DPII months differential	3.9 (0.04)	3.7	6.0 (0.07)	5.6	5.5 (-0.02)	4.8 (-0.14)
BSID physical development index	96.9 (-0.05)	97.7	NA	NA	NA	NA
Child Health and Health Care						
Fully immunized for child's age ^e	61.8 (0.01)	61.3	28.6 (0.09)	24.6	38.9^c (0.31)	33.3 (0.19)
Treated for injury in the past year ^f	8.1 (-0.12)	11.9	25.7 (-0.06)	28.6	10.0 (-0.48)	16.2 (0.30)
Had emergency room treatment in past year	20.3 (-0.12)	24.5	NA	NA	NA	NA
Had opened case of child abuse or neglect	NA	NA	1.3 (-0.08)	2.4	2.7 (0.02)	0.0^c (-0.31)
Sample sizes						
DPII, injury, and emergency room treatment	210	153	90	96	88	89
Immunizations	110	93	56	65	54	60
Child abuse	—	—	149	163	148	138
BSID	131	91	—	—	—	—
PPVT	188	132	—	—	—	—

^a Effect sizes are in parentheses. See note no. 32 at the end of this article for a discussion of effect sizes.

^b Bold type indicates statistically meaningful or significant differences.

^c Statistically significant difference from the control group in a one-tailed test at the $p < .05$ level.

^d DPII and PPVT scores are presented as months differential, or the difference in months between a child's chronological age and the age corresponding to the skill level assessed. For example, if a child was 12 months old but had the physical skills of a 15-month-old, the physical age score would be +3, or a positive differential of three months. If the child had the physical skills of a nine-month-old, the physical age score would be -3, or a negative differential of three months.

^e For Salinas Valley PAT, immunizations are those appropriate for three-year-olds; for Teen PAT, immunizations are age appropriate for two-year-olds.

^f For Salinas Valley PAT, past year care for three-year-olds was in the year preceding assessment. For Teen PAT two-year-olds, recent care was in the six months preceding assessment.

Table 4

Results of Multivariate Analyses of Parent and Child Outcomes for Parents as Teachers (PAT) Participants				
Outcomes	Change in Dependent Variable Associated with Intervention (Versus Control Group)			
	Salinas Valley PAT	Teen PAT		
		PAT	Case Management	Combined Intervention
Parenting Outcomes				
Full Knowledge of Infant Development Inventory (KIDI) score	-0.6	1.4	0.6	-0.1
Parenting Sense of Competence (PSOC) full scale score	0.7	1.7	0.8	0.7
Full Home Observation for Measurement of the Environment (HOME) score	0.9	-0.2	-0.1	0.1
Child Development Outcomes				
Developmental Profile II (DPII) Cognitive Development Scale	1.5^a	1.0	1.3^a	1.4^a
Bayley Scales of Infant Development (BSID) Cognitive Development Scale	0.4	NA	NA	NA
DPII Communication Development Scale	1.3	1.4	0.6	0.4
Peabody Picture Vocabulary Test (PPVT) Language Test	1.6	NA	NA	NA
DPII Social Development Scale	2.4^a	1.5	1.3	0.9
DPII Self-Help Development Scale	2.3^a	0.1	1.1	0.3
DPII Physical Development Scale	1.2	0.2	-0.2	-0.2
BSID Physical Development Scale	-1.2	NA	NA	NA

^a Statistically significant effect at the p=.05 level.

and child care setting (center-based care compared with any other type of care). In the Teen PAT multivariate analysis, factors included mother’s age, ethnicity, school attendance, pregnancy status, and self-reported experience with infants at enrollment; whether the father lived in the household; and whether the household received AFDC or welfare.

In general, the results of these multivariate analyses, summarized in Table 4, suggested that participation in PAT conferred greater benefits than were apparent in the analyses of the entire randomized group. Although the multivariate analyses did not demonstrate significant positive impacts on parenting outcomes, the small negative effects associated with PAT in the initial analyses were eliminated or reduced. Parti-

cipation in PAT was associated with a statistically significant 1.3- to 1.5-month advantage in cognitive development over the control group for Salinas Valley PAT children and for Teen PAT case management and combined intervention children, as measured by the DPII (p<.05).

In the areas of social and self-help development, participation in PAT was associated with statistically significant 2.4- and 2.3-month advantages, respectively, for Salinas Valley PAT children on the DPII (p<.05). With the exception of physical development, all relationships were positive in both studies, although no others were statistically significant.

In sum, the analyses suggested that PAT alone produced modest benefits in the area

of child development (especially cognitive, social, and self-help) but no measurable benefits for parents or the home environment. In the Teen PAT Demonstration, children in the combined PAT-plus-case-management group were less likely to be subjects of child abuse investigations ($p < .05$).

PAT Effectiveness for Families with Latina Mothers

The Salinas Valley PAT Demonstration included (1) immigrant Latino families that were primarily Spanish-speaking, (2) Latino families whose primary language was English or that were bilingual, and (3) non-Latino families. It was therefore possible to examine the differential effectiveness of PAT among these groups.³⁵

As Table 5 illustrates, families with Latina mothers were different in many respects from those with non-Latina mothers. Latino parents, as a group, were

Children of Latina mothers derived greater benefit from the program than did children of non-Latina mothers, and children of Spanish-speaking Latinas benefitted most.

younger, less well educated, less likely to be working, and less likely to be married than non-Latino parents. Latina mothers were less likely to be well informed about parenting and children.

However, Latina-mother families were not homogeneous. For example, primarily Spanish-speaking Latino parents (usually first-generation immigrants) were older and more likely to be married than their English-speaking or bilingual counterparts. They were less well educated, and mothers were less likely to be working and felt less informed regarding children and parenting. To the extent that these differences influenced the parent and child outcomes studied, quite different results would be expected across these groups.

Parenting Outcomes by Ethnic and Language Group

Results indicated that the effects of PAT differed across ethnic and language subgroups

of Salinas Valley participants. Specifically, as illustrated in Table 6, different patterns of effects were found among Latinas and non-Latinas in the areas of parent knowledge, attitudes, and behaviors. In general, it appears that PAT did not produce benefits for non-Latina families but did benefit Latina families.

For example, non-Latina mothers in PAT scored significantly lower on the parent efficacy subscale of the PSOC Scale than their control group counterparts, while Latina mothers had significantly higher scores, particularly those Latina mothers who were primarily English-speaking or bilingual. Non-Latina PAT mothers also scored worse than non-Latina control group mothers on the total HOME parenting behavior scale and several of its subscales, but there were essentially no differences between Latina PAT and control group mothers on the HOME and its subscales.

Child Outcomes by Ethnic and Language Group

Table 7 compares child outcomes for each of the ethnic and language subgroups. Results indicated that children of Latina mothers derived greater benefit from the program than did children of non-Latina mothers, for whom program effects often were negative, and that children of Spanish-speaking Latinas benefitted most. For example, a statistically significant positive effect was noted for the cognitive development of children of Latina mothers as measured by the DPII but not for children of non-Latinas. Although these children's cognitive development lagged behind their chronological age (that is, there was a negative months differential DPII score on cognitive development), the lag was 1.4 months smaller for children of Latina mothers in the PAT group than for children of Latina control group mothers. The effect size was somewhat larger for children of Spanish-speaking Latina mothers than for children of English-speaking or bilingual Latinas (0.32 versus 0.23). Children of Spanish-speaking Latinas outscored their control group counterparts on the mental development subscale of the BSID by almost six IQ points, while PAT children of non-Latina mothers actually scored about four points lower than their control group counterparts.

Table 5

Characteristics of Salinas Valley Parents as Teachers (PAT) Mothers at Enrollment, by Ethnicity and Primary Language				
Characteristics	Ethnicity and Primary Language of Mothers			
	Non-Latina	Latina	Spanish-Speaking Latina	English-Speaking or Bilingual Latina
Average Age				
Mother	27.3 ^a	25.2 ^b	26.8	23.2 ^c
Father	30.6	27.7 ^d	29.5	25.6 ^c
Household Composition				
Mother was married	71.6 ^c	53.5	67.1	37.2 ^c
Father lived in the household	80.0 ^b	70.6	82.7	56.3 ^c
Married, two-parent household	69.5	56.0 ^b	66.7	36.8 ^c
Mother was only adult in household	5.3 ^d	12.2	7.8	17.5 ^b
Child had siblings	43.2 ^b	55.2	61.6	47.5 ^b
Highest Education Level				
Mother				
Less than high school	12.6	69.2 ^c	84.0	51.4 ^c
High school only	20.0	18.4	11.9	26.2 ^d
Any postsecondary education	67.4	12.4 ^c	4.1	22.4 ^c
Father				
Less than high school	12.5	70.3 ^c	81.5	56.3 ^c
High school only	25.0	19.4	12.4	28.2 ^b
Any postsecondary education	62.5	10.3 ^c	6.2	15.5
Economic Status				
Mother was working or in job training	46.3	18.2 ^c	9.6	28.4 ^d
Father was working or in job training	86.5	66.3 ^c	68.3	63.8
Household received AFDC	15.8	21.6	11.9	33.3 ^d
Household had Medi-Cal	35.8	66.7 ^c	73.5	58.5 ^b
Mother's Knowledge and Information-Gathering Behavior About Children or Parenting				
Ever taken a class on child care	39.8	13.0 ^c	1.8	26.5 ^c
Assessed own knowledge of infants as "high"	20.0	10.8	2.8	20.7 ^c
Mean scale score for general information-seeking behavior ^e	13.8	12.1 ^c	NA	NA
Sample size				
Mothers	95	402	219	183
Fathers	92	341	187	154

^a Bold type indicates statistically meaningful or significant differences.
^b Statistically significant difference between groups in a two-tailed test at the p<.05 level.
^c p<.001
^d p<.01
^e Many parents actively sought information about children and parenting from a variety of sources, most commonly friends and relatives. To obtain a picture of the overall level of information seeking by parents about children and parenting, a scale was created specifically for the study in which a value of 1 was assigned for seeking information less than monthly, a value of 2 for seeking information monthly, 3 for weekly information seeking, and 4 for more frequent than weekly information seeking. Summing values for the five sources results in a scale that ranges from 5 to 25, with a mean of 12.4.

Table 6

Parenting Outcomes for Salinas Valley Parents as Teachers (PAT) Participant and Control Groups by Mother's Ethnicity and Primary Language								
Outcomes	Children of							
	Non-Latina Mothers		Latina Mothers		Spanish-Speaking Latinas		English-Speaking or Bilingual Latinas	
	PAT ^a	Control Group	PAT ^a	Control Group	PAT ^a	Control Group	PAT ^a	Control Group
Parenting Knowledge								
Average percentage of Knowledge of Infant Development Inventory (KIDI) parent knowledge items answered correctly	81.0% (0.10)	80.0%	63.4% (-0.15)	65.1%	59.5% (-0.18)	61.5%	68.3% (-0.15)	69.8%
Parenting Attitudes								
Total parental attitude scale	56.3 (-0.28)	58.0	51.6 (0.06)	51.1	49.2 (0.01)	49.2	54.5 (0.12)	53.6
Parent satisfaction subscale	27.8 (-0.28)	29.0	24.9 (-0.12)	25.6	23.3 (-0.22)	24.5	26.8 (-0.01)	26.9
Parent efficacy subscale	28.5 (-0.20)	29.0	26.8^{b,c} (0.30)	25.8	26.0 (0.27)	25.1	27.8^d (0.35)	26.6
Parenting Behaviors								
Total Home Observation for Measurement of the Environment (HOME) scale	40.5 (-0.32)	41.8	35.4 (0.15)	34.6	35.2 (0.14)	34.4	35.8 (0.14)	34.8
Acceptance of child's behavior subscale	7.2^c (-0.66)	7.7	6.3 (-0.13)	6.4	6.2 (-0.23)	6.4	6.3 (-0.04)	6.4
Opportunity for stimulation subscale	4.0 (-0.30)	4.3	3.3 (0.03)	3.3	3.4 (-0.04)	3.4	3.3 (0.12)	3.1
Organization of the environment subscale	5.6 (-0.45)	5.9	5.8 (0.19)	5.6	5.9 (0.21)	5.8	5.5 (0.24)	5.3
Parental involvement subscale	4.8 (-0.24)	5.1	3.8 (0.14)	3.6	3.8 (0.23)	3.3	3.9 (0.00)	3.9
Parental responsiveness subscale	10.1 (-0.30)	10.5	9.8 (0.14)	9.6	10.1 (0.08)	9.9	9.6 (0.22)	9.1
Appropriate play materials subscale	8.6 (0.18)	8.4	6.4 (0.10)	6.2	5.8 (0.13)	5.5	7.1 (0.04)	7.0
Language- and literacy-promoting behaviors	7.3 (-0.07)	7.4	5.5 (0.14)	5.2	5.2 (0.26)	4.7	5.9 (-0.02)	6.0
Mother-child interaction	5.1 (-0.18)	5.5	5.2 (0.07)	5.1	5.4 (0.06)	5.3	4.9 (0.09)	4.8
Discipline	5.7^d (-0.64)	6.0	5.7 (-0.19)	5.8	5.8 (-0.29)	5.9	5.6 (-0.10)	5.7
Sample size	35	37	167	111	93	63	74	48

^a Effect sizes are in parentheses. See note no. 32 at the end of this article for a discussion of effect sizes.
^b Bold type indicates statistically meaningful or significant differences.
^c Statistically significant difference from the control group in a one-tailed test at the p<.01 level.
^d p<.05

Table 7

Child Development Outcomes for Salinas Valley Parents as Teachers (PAT) Participant and Control Groups by Mother's Ethnicity and Primary Language								
Outcomes	Children of							
	Non-Latina Mothers		Latina Mothers		Spanish-Speaking Latinas		English-Speaking or Bilingual Latinas	
	PAT ^a	Control Group	PAT ^a	Control Group	PAT ^a	Control Group	PAT ^a	Control Group
Cognitive Development								
Developmental Profile II (DPII) months differential ^b	5.1 (0.06)	4.7	-1.7^{c,d} (0.26)	-3.1	-2.8^d (0.32)	-4.1	-0.4 (0.23)	-1.9
Bayley Scales of Infant Development (BSID) mental development index	99.6 (-0.37)	104.4	88.9 (0.22)	86.0	86.7 (0.50)	80.9	91.4 (-0.08)	92.4
Communication Development								
DPII months differential	8.4 (-0.09)	9.3	4.7 (0.10)	3.9	5.2 (0.13)	4.2	4.2 (0.07)	3.6
Peabody Picture Vocabulary Test (PPVT) months differential	0.9 (-0.06)	1.4	0.2 (0.11)	-0.8	4.1^d (0.36)	1.4	-4.7 (-0.11)	-3.8
Social Development								
DPII months differential	8.8 (-0.13)	9.8	7.1^e (0.28)	4.6	8.2^d (0.31)	5.7	5.7 (0.26)	3.2
Self-Help Development								
DPII months differential	9.7 (0.10)	8.9	13.7^d (0.25)	11.4	16.0 (0.27)	13.7	10.9 (0.25)	8.4
Physical Development								
DPII months differential	6.7 (0.23)	5.2	3.3 (0.03)	3.2	3.4 (-0.09)	3.8	3.2 (0.15)	2.3
BSID physical development index	100.4^d (-0.50)	106.5	96.1 (0.13)	93.8	94.3 (0.33)	88.1	98.2 (-0.19)	100.9
Sample sizes								
DPII	36	38	174	115	96	64	78	51
BSID	23	28	108	63	58	35	50	28
PPVT	30	33	158	99	88	58	70	41

^a Effect sizes are in parentheses. See note no. 32 at the end of this article for a discussion of effect sizes.

^b DPII and PPVT scores are presented as months differential, or the difference in months between a child's chronological age and the age corresponding to the skill level assessed. For example, if a child was 12 months old but had the physical skills of a 15-month-old, the physical age score would be +3, or a positive differential of three months. If the child had the physical skills of a nine-month-old, the physical age score would be a -3, or a negative differential of three months.

^c Bold type indicates statistically meaningful or significant differences.

^d Statistically significant difference from the control group in a one-tailed test at the p<.05 level.

^e p<.01

Additional significant program benefits to children of Latina mothers were found on the DPII scales of social and self-help development, with differences between PAT and control group children of 2.5 and 2.3 months, respectively. Again, effects were marginally larger for children of Spanish-speaking Latina mothers. Moderate and significant benefits also were noted for children of Spanish-speaking Latina moth-

ers on the PPVT and on the physical development subscale of the BSID. Thus, several developmental benefits occurred for children of Latina mothers, particularly those who were primarily Spanish-speaking. These benefits had not been apparent in earlier analyses because they had been overshadowed by the poor outcomes experienced by the children of non-Latina mothers.

The poor outcomes for non-Latina mothers and their children may have been related to the markedly higher rate of marital instability among non-Latinas during the demonstration. Whereas 76% of non-Latinas in the PAT group were married at enrollment, 8% experienced divorce or separation during the course of the intervention. This contrasts sharply with the steady increase of up to 14 percentage points in the marriage rate (that is, more mothers were married) in the non-Latina control group and among the English-speaking, Spanish-speaking, and bilingual Latina participant and control groups between enrollment and the third assessment. (These data do not appear in any table.)

Multivariate analyses (also not reported in the tables) demonstrated that marital dissolution had a significant negative impact on several outcomes for children, controlling for other factors. For example, for non-Latina mothers, experiencing divorce during the demonstration resulted in seven

points. As discussed earlier, 43% of families that were assigned to the participant group in the Salinas Valley PAT Demonstration dropped out of the intervention before the children reached their third birthdays, and 57% of the teens in the three intervention groups (PAT, case management, and PAT plus case management) in the Teen PAT Demonstration dropped out before the children's second birthdays.

Even among those who persisted in the program, other variations in exposure occurred because families were not always able to keep their home visit appointments. For example, 11% of attempted home visits by Teen PAT parent educators were "no-shows," that is, the teen was not home when the parent educator arrived for the arranged visit. Case managers had about 35% of their attempted home contacts end as no-shows for the case management and combined intervention groups. More than 40% of Salinas Valley PAT families that persisted through the children's third birthdays had gaps of four months or more in their home visits, largely because many families returned to Mexico for extended periods each winter.

Eleven percent of attempted home visits by Teen PAT parent educators were "no-shows."

fewer points on the total score for the HOME Inventory, and 11 fewer points on the PPVT for children.³⁶ Thus, a greater incidence of divorce among non-Latina participants relative to non-Latina control group members may have contributed to poor participant outcomes for that group.

Variations in Program Exposure Influence Outcomes

Existing studies of the effectiveness of PAT and home visiting in general have tended to consider the intervention as a "black box." Little is known about variations in the ways families experience home visiting programs and the differences those variations make in the outcomes children and families achieve.

One clear difference in families' experiences of PAT was the degree to which they were exposed to the PAT curriculum through home visits. In any program, some percentage of enrollees discontinue their participation before the program is com-

pleted. These kinds of variations resulted in considerably reduced exposure to the program for all groups when compared to the monthly home visits intended by program planners at these sites. Salinas Valley PAT families as a whole averaged almost 20 home visits in three years, with those that completed the program (n=169) averaging 28 visits, as compared with 8 visits for dropouts (n=129). Teen PAT families averaged 10 home visits and/or in-person case management contacts. Those that persisted through the children's second birthdays (n=76 for the PAT group, 64 for the case management group, and 84 for the combined intervention) averaged about three times the exposure of both home visits (16) and case management contacts (17 and 14 contacts, respectively, for the case management and combined intervention groups) as did dropouts (n=92 for the PAT group, 105 for the case management group, and 89 for the combined intervention group), with an average of five home visits and/or case management contacts. Given the high proportion of families that dropped out of their programs and the relatively low level of program service that dropouts experienced, it is impor-

tant to assess whether PAT achieved more substantial impacts when experienced at a higher level of exposure.

In the Salinas Valley PAT Demonstration, parent and child outcomes for families that had dropped out of the program and families that persisted in the program were analyzed separately to determine whether each group had significantly better outcomes than control group members. A more fine-grained analysis was conducted to determine whether the number of home visits that families received contributed significantly to parent and child outcomes relative to no home visits (that is, the control group).

In the Teen PAT Demonstration, the effect on parent and child outcomes of receiving the intended level of program service as compared with not receiving the intended level of program service was examined. For the PAT group, the intended level of program service as defined by the Parents as Teachers National Center (PATNC) was 17 home visits for each family through the children's second birthdays.³⁷ For the case management group, four personal contacts per year was the minimum acceptable level of service as determined by the state funding agency for those services. For the combined intervention group, both thresholds needed to be met for a family to be considered to have received the intended level of program service.

Families that participated more in the programs may have differed from other families in ways other than the level of services they received. Because these differences may have influenced outcomes, multivariate analyses that controlled for a variety of individual characteristics³⁸ were conducted. However, even though the influence of important measurable differences between families that may have affected their outcomes was taken into consideration, it is possible that unmeasured factors may have distinguished high-exposure families and influenced the relationship between program exposure and outcomes.

Results of Analyses Concerning Program Exposure

Neither demonstration found that greater exposure to program services was related to greater parenting impacts. Although virtu-

ally all relationships between having greater exposure to a program and parenting outcomes were positive, in no case did they reach statistical significance, controlling for other factors.

However, Table 8 illustrates that the level of service participants received did relate to the level of benefit to children. In the Salinas Valley Demonstration, persisting in PAT through the children's third birthdays was significantly related to higher DPII scores in the cognitive, social, and self-help domains. Persisting to the end of the intervention (rather than being in the control group) was

Home visits were associated with a one-month developmental advantage per 10 home visits in the cognitive, social, and self-help domains for children in the PAT participant group in the Salinas Valley study.

associated with a developmental advantage of 1.7 to 2.6 months across these domains, controlling for other factors. Similarly, each home visit was associated with a significant benefit in these domains. Home visits were associated with a one-month developmental advantage per 10 home visits in the cognitive, social, and self-help domains for children in the PAT participant group in the Salinas Valley study.

Findings regarding exposure to program services were less consistent in the Teen PAT Demonstration. Only in the case of cognitive development as measured by the DPII was the impact of receiving the intended level of services statistically significant, controlling for other factors in the analyses. Receiving the intended level of exposure was associated with a 1.6-month developmental advantage for children assigned to the case management group ($p < .05$) and a 1.7-month developmental advantage for children assigned to the combined PAT-plus-case-management group ($p < .10$). No impact was noted for children in the PAT-alone group, even when the intended number of home visits was made.

The inconsistent findings regarding the influence of the level of program exposure on outcomes mirror the inconclusiveness of

Table 8

Relationship of Intervention Intensity to Child Development Outcomes for Participants in Salinas Valley Parents as Teachers (PAT) and Teen PAT								
Outcomes	Developmental Domain							
	Cognitive		Social	Self-Help	Communication		Physical	
	DPII ^a	BSID ^a	DPII	DPII	DPII	PPVT ^a	DPII	BSID
Salinas PAT								
Change in development score associated with								
Being a dropout (versus control group)	0.7	0.8	2.2	0.9	1.7	-2.0	0.5	2.5
Being a persister (versus control group)	1.7^b	0.4	2.5^b	2.6^b	1.2	2.3^c	1.3	-1.7
Each home visit	0.1^b	0.0	0.1^b	0.1^b	0.0	0.1^b	0.1^c	-0.1
Teen PAT								
Change in months differential ^d associated with expected level of intensity of								
PAT	0.0	NA	0.2	0.2	1.2	NA	-1.4	NA
Case management	1.6^b	NA	1.7	1.7	0.9	NA	0.1	NA
Combined intervention	1.7^c	NA	1.2	0.4	0.2	NA	-0.6	NA

^a DPII refers to the Developmental Profile II scale; BSID refers to the Bayley Scales of Infant Development; PPVT refers to the Peabody Picture Vocabulary Test.

^b Statistically significant relationship at the p<.05 level.

^c p<.01

^d DPII scores are presented as months differential, or the difference in months between a child's chronological age and the age corresponding to the skill level assessed. For example, if a child was 12 months old but had the physical skills of a 15-month-old, the physical age score would be +3, or a positive differential of three months. If the child had the physical skills of a nine-month-old, the physical age score would be a -3, or a negative differential of three months.

other home visiting and family support research, in which intensity has been found to contribute to greater impact in some studies³⁹ but not in others.⁴⁰

Summary

The Salinas Valley PAT Demonstration focused on the effectiveness of PAT for a largely Latino group of families, and the Teen PAT Demonstration examined the effectiveness of PAT alone and in combination with case management services for teen parents and their children. Members of both populations have a variety of characteristics that make them difficult to serve. Given the youth and developmental stage of teen parents, a two-year commitment to an intervention program was truly challenging to sustain. In both groups, poverty, household instability, and poor education were common. These factors undoubtedly contributed to the fact that families' actual exposure to the PAT curriculum was considerably lower than intended.

Thus, with the challenging populations served and the difficulty in providing the intended level of service, it is not surprising that the overall effects of PAT in both demonstrations were not large. Neither demonstration achieved consistent positive effects on parenting knowledge, attitudes, or behaviors. Some benefits to children in the area of child development were identified in both demonstrations, although they were small and not consistent across developmental domains. These benefits appeared stronger when demographic and other factors were controlled for in multivariate analyses.

These results from the evaluations of the Salinas Valley and Teen PAT Demonstrations are consistent with the overall research base for family-focused early childhood programs, which have produced "modest and inconsistent effects."⁴¹ A review of randomized trials of 15 home visiting programs for low-income families that

assessed parenting impacts found positive effects for only eight programs, and significant short-term effects on children's cognitive or behavioral development in less than half of the randomized trials that assessed such outcomes.⁴²

However, the Salinas Valley PAT Demonstration revealed that families differed in the extent to which they benefitted from PAT. Outcomes of all kinds were more positive for families with Latina mothers (relative to a Latina control group) than for those with non-Latina mothers (relative to their non-Latina peers), with the exception of the parenting knowledge score. However, parenting impacts were weak and somewhat inconsistent, even for Latina mothers. The impact on child development, which was stronger than the impact on parenting in the demonstration overall, was consistently positive and in many cases statistically significant for children of Latina mothers, particularly those who were primarily Spanish-speaking. Children of Latina mothers had moderate or statistically significant positive effects in three of the five developmental domains examined (cognitive, social, and self-help); children of those who were primarily Spanish-speaking benefitted significantly in four of the five domains (cognitive, communication, social, and self-help).

Thus, the Salinas Valley PAT Demonstration offered some support for the notion that PAT could usefully be targeted to families of Latino parents with limited English proficiency, particularly if they could be retained in the program through completion so that they received a substantial number of home visits. Analyses of the impact of increased exposure in the Salinas Valley Demonstration suggested that completing the program, receiving more home visits, and receiving more home visits targeted to particular developmental domains enhanced the benefits to children's development in several areas. In the time since the Salinas Valley Demonstration, the PATNC has recommended that local programs provide home visits at frequencies in accordance with individual family needs, whether monthly, biweekly, or weekly.

On the other hand, there was little evidence in the Teen PAT Demonstration to support targeting the PAT program as imple-

mented in this demonstration project to teen parents. Teens are a challenging group to engage and retain, and analyses showed little or no benefit on most outcome measures for either parents or children from PAT services, either alone or in combination with case management services. Some of this may result from the small percentage of families that actually received the intended level of service. However, controlling for other factors, a greater exposure to home visits was not significantly related to better teen parent or child outcomes.

It is important to note, however, that the Teen PAT Demonstration implemented the general PAT curriculum. Subsequently, the PATNC launched a new curriculum and training program for parent educators who serve teen parents, recognizing the increased

The PATNC launched a new curriculum and training program for parent educators who serve teen parents, recognizing the increased challenges and specific curricular and pedagogic emphases needed for that group.

challenges and specific curricular and pedagogic emphases needed for that group. (See Appendix B in this journal issue.) It is unknown whether home visits using that curriculum would result in more substantial benefits for teen parents or their children.

Finally, the two demonstrations raised questions about the fundamental premise of PAT: that focusing services on parents to improve parenting knowledge, attitudes, and behaviors is an effective way to benefit children. In Salinas Valley PAT, both for the demonstration overall and for the more powerfully impacted group of Latina mothers and their children, benefits for children were identified without a corresponding pattern of positive impacts on parents. Although it is quite possible that parent impacts occurred that were not captured by the measurement tools employed, it is also possible that PAT benefitted children directly in ways that are not clearly understood.

Whatever the explanation, these findings support an emerging conclusion regarding parent- and child-focused programs:

“Theoretically, involving parents, changing parenting attitudes and behaviors, and improving parent-child interactions should have both short- and long-term positive effects on child development. . . . However, there is little research evidence to support the assumption that parent services affect child outcomes.”⁴³

Thus, unanswered questions remain regarding the extent to which PAT supports the positive development of young children, the kinds of children and families that benefit, and the ways in which those benefits are achieved. In an effort to continue to develop the research base regarding PAT, the pro-

gram is being evaluated in a randomized trial in three urban locations around the country with high proportions of low-income and minority families.⁴⁴ This study will employ additional measures of parent-child interactions and will allow further exploration of the effectiveness of PAT for these families. Further, the measurement battery in the new study is being enhanced for the measurement of parent-child interactions in an effort to better understand the influence of PAT on the intersection between parent behavior and child development. Findings from the current demonstration are expected to be released in 2001.

1. Additional Parents as Teachers program goals, as stated in Appendix B in this journal issue, are to (1) empower parents to give children the best start in life, (2) develop home-school-community partnerships on behalf of children, and (3) prevent and reduce child abuse.
2. Parents as Teachers National Center. *Parents as Teachers National Center receives grants to pilot Neuroscience Project with high needs families in Chicago*. News release. St. Louis, MO: Parents as Teachers National Center, 1997.
3. Winter, M., and Rouse, J.M. Parents as Teachers: Nurturing literacy in the very young. *Zero to Three* (September 1991) 12:80–83.
4. Montgomery, D.L., and Duenas, I.E. *Parents as Teachers cost analysis—Phase I report*. Palo Alto, CA: American Institutes of Research, 1997. The David and Lucile Packard Foundation commissioned a cost study as part of the Northern California Parents as Teachers Demonstration. The average monthly cost of serving a family was determined to be \$170 in 1996 dollars. Given the average participation length of 30.1 months, the average cost per family was determined to be \$5,117. Those that persisted in the program through the children’s third birthdays averaged 35.4 months of participation, for an average per-family cost of \$6,018. Dropouts from the program averaged 17.8 months of participation, for an average per-family cost of \$3,026.
5. For example, the Prenatal/Early Infancy Project. See Olds, D.L., Henderson, C.R. Jr., Tatelbaum, R., and Chamberlin, R. Improving the life-course development of socially disadvantaged mothers: A randomized trial of nurse home visitation. *American Journal of Public Health* (1988) 11:1436–44. Costs in 1996 dollars for this program as it operated in Elmira, New York, were estimated to be approximately \$6,000 to serve a family through the child’s second birthday. See Karoly, L.A., Greenwood, P.W., Everingham, S.S., et al. *Investing in our children. What we know and don’t know about the costs and benefits of early childhood interventions*. Santa Monica, CA: RAND Corporation, 1998.
6. For example, in the Perry Preschool Program, which was estimated to cost \$12,000 per child in 1996 dollars, children were provided center-based services when they were three or four years old, through kindergarten entry. Barnett, W.S. Benefit-cost analysis of preschool education: Findings from a 25-year follow-up. *American Journal of Orthopsychiatry* (1993) 63:500–08.
7. In the legislation (AB 3646), funding for the PAT grant program was made contingent on the passage of and sufficient fiscal appropriations for a related piece of legislation. The contingencies were not met, no state funds were allocated for implementation of PAT in California, and the authorizing legislation expired in 1996.
8. Because these two demonstrations focused entirely on Latino and teen-parented families, findings cannot be assumed to be representative of the typically more diverse families PAT usually serves.
9. Developing a long-term evaluation strategy for the Parents as Teachers National Center and program: A report on an invitational meeting held at The Ewing Marion Kauffman Foundation in Kansas City, Missouri on April 4–5, 1994 and funded by The Ewing Marion Kauffman and David and Lucile Packard Foundations, The Pew Charitable Trusts, and The National Center. Unpublished.

10. Miller, S. *A select review of past and current evaluations of the Parents as Teachers program*. St. Louis, MO: Parents as Teachers National Center, 1995.
11. See, for example, Pfannenstiel, J.C., and Seltzer, D.A. New Parents as Teachers: Evaluation of an early parent education program. *Early Childhood Research Quarterly* (1989) 4:1–18; Pfannenstiel, J.C., Lambson, T., and Yarnell, V. *The Parents as Teachers program: Longitudinal follow-up to the second wave study*. Overland Park, KS: Research and Training Associates, 1995; Wagner, M. Evaluation of the National City Parents as Teachers program: Summary of findings. Unpublished, 1993; Coates, D. *Early childhood evaluation. A report to the Parkway Board of Education*. St. Louis, MO: Parkway School District, 1994; and Pfannenstiel, J.C. *Kansas Parents as Teachers program*. Overland Park, KS: Research and Training Associates, 1997. Appendix B in this journal issue contains additional descriptions of these studies and their findings.
12. See, for example, Drazen, S.M., and Haust, M. *Increasing children's readiness for school by a parental education program*. Ithaca, NY: Cornell University, 1994; and Davis, J.E., Russell, R.L., and Ketchum, P. *Evaluation report: Parents as Teachers program*. Newark, DE: Parent Early Education Center, University of Delaware, 1991.
13. Weiss, H. Home visits: Necessary but not sufficient. *The Future of Children* (Winter 1993) 3,3:113–28.
14. See note no. 11, Pfannenstiel and Seltzer. See also Owen, M.T., and Mulvihill, B.A. Benefits of a parent education and support program in the first three years. *Family Relations* (1994) 43:206–12; and Wheeler, H. *A study of the Missouri Parents as Teachers program and its effects on the readiness skills of children entering kindergarten in southwest Missouri public schools*. Blue Eye, MO: Blue Eye School District, 1994.
15. Collaborating school districts included: Alisal Union Elementary, Chualar Elementary, Gonzalez Union Elementary, North Monterey County Unified, Salinas City Elementary, Salinas Union High School, Santa Rita Union Elementary, Soledad Union Elementary, and Spreckels Union Elementary.
16. Wagner, M., and McElroy, M. *Home, the first classroom: A pilot evaluation of the Northern California Parents as Teachers project*. Menlo Park, CA: SRI International, 1992.
17. Over the 10-year course of the pilot and demonstration phases, Salinas Valley PAT services and evaluation were supported by grants from The Cowell Foundation, The Monterey County Community Foundation, The Harden Foundation, The David and Lucile Packard Foundation, and The Ford Foundation, as well as by in-kind contributions from the participating school districts and the Monterey County Office of Education.
18. Children Now. *California county data book, 1995*. Oakland, CA: Children Now, 1996.
19. Wagner, M., Clayton, S., Gerlach-Downie, S., and McElroy, M. *An evaluation of the Northern California Parents as Teachers Demonstration: Review draft*. Menlo Park, CA: SRI International, 1997.
20. Data regarding the length of home visits come from videotapes of a sample of 75 home visits to 21 families in the Salinas Valley PAT Demonstration. Visits were videotaped as part of a qualitative study funded by The Ford Foundation. Gerlach-Downie, S., and Hebbeler, K. *Parent education: How does it work? Qualitative assessment of the Parents as Teachers model of parenting education*. Menlo Park, CA: SRI International, 1997.
21. The sample of children for whom BSID assessments were conducted was a volunteer sample. At the three-year-old assessment, 91 control group children and 131 participant group children were assessed. BSID-assessed children were more likely to be white and to have better-educated mothers and fathers who were working than the full sample. Further, control group mothers of children with BSID assessments were significantly more likely than PAT group families to have some postsecondary education (35% versus 19%, $p < .01$). To the extent that maternal education influences child development, the higher maternal education of the control group may have given those children an advantage relative to participants. BSID sample characteristics are reported fully in note no. 19, Wagner, Clayton, Gerlach-Downie, and McElroy.
22. Funders of the Teen PAT Demonstration included the California Office of Child Abuse Prevention within the California Department of Social Services, the California Department of Health Services' Maternal and Child Health Branch, The David and Lucile Packard Foundation, and the Stuart Foundations.
23. Wagner, M., Cameto, R., and Gerlach-Downie, S. *Intervention in support of adolescent parents and their children: A final report on the Teen Parents as Teachers Demonstration*. Menlo Park, CA: SRI International, 1996.

24. Although PAT services normally are extended to families through children's third birthdays, and case management services are offered to teens through age 18, the funding for the services component of the demonstration from the California Office of Child Abuse Prevention was sufficient to serve families only through children's second birthdays. Thus, the findings reported here may not reflect the impacts that the full-term services would have achieved for parents or children.
25. In the Teen PAT study, changes in maternal life course also were assessed (for example, changes in maternal enrollment in school, welfare receipt, education, and marital status; and repeat pregnancies and births). These results are summarized in Appendix B in this journal issue but are not reported here because they are outcomes that were hypothesized to occur as a result of the case management services afforded the teen mothers, rather than the PAT home visiting services. Generally, the PAT, case management, and combined PAT-plus-case-management groups showed few significant benefits over the control group in terms of maternal life course outcome.
26. MacPhee, D. Knowledge of Infant Development Inventory. Unpublished manuscript, University of North Carolina, Chapel Hill, 1989. Available from David L. MacPhee, Ph.D., Human Development and Family Studies, Colorado State University, Fort Collins, CO 80523.
27. Gibaud-Wallston, J., and Wandersman, L.P. Development and utility of the Parenting Sense of Competence Scale. Paper presented at the meeting of the American Psychological Association. Toronto, Canada. 1978.
28. Caldwell, B.M., and Bradley, R.H. *Home Observation and Measurement of the Environment*. Little Rock, AK: University of Arkansas at Little Rock, 1984.
29. Alpern, G., Boll, T., and Shearer, M. *Developmental Profile II*. Los Angeles: Western Psychological Services, 1986.
30. The Psychological Corporation. *Bayley Scales of Infant Development*. Second ed. San Antonio, TX: The Psychological Corporation, 1993.
31. Dunn, L.M., and Dunn, L.M. *Peabody Picture Vocabulary Test—Revised*. Circle Pines, MN: American Guidance Service, 1981.
32. Results from the two evaluations were analyzed and reported in several ways. T tests were used to compare the experimental and control groups. Results are reported in Tables 2 and 3. The tables highlight findings in which the T tests suggested that true differences between the groups existed at a probability of $p < .05$.
 Because p values depend on sample size, small groups may make it hard to achieve significant p values, even when differences exist between experimental and control groups. Effect size is a statement of the magnitude of the difference between two groups and is not dependent upon group size. Effect sizes often are reported, therefore, when studies have small samples to help identify where meaningful effects may have occurred. These effects are reported in Tables 2, 3, 6, and 7.
 The following can serve as a gauge of the importance of any particular effect: For the parent outcomes and the child development outcomes, an effect size of 0.1 to 0.3 is considered small, 0.31 to 0.5 is considered moderate, and greater than 0.5 is considered large. For the child health and health care outcomes, an effect size of 0.2 to 0.49 is considered small, 0.5 to 1.0 is considered moderate, and greater than 1.0 is considered large. (The importance of the effects varies as a function of whether the factor being tested is a dichotomous, that is, a "yes" or "no" variable, or an ordinal variable, such as a test score from a scale of possible scores.)
 Multivariate analyses (ordinary least-squares regressions, or logistic regressions) were also used to control for individual, family, and household characteristic differences between the participant and control groups that might be related to observed outcomes, and to attempt to quantify the magnitude of change that a single unit of the intervention could be expected to produce. For example, analyses were conducted to suggest how many home visits would be needed to produce one month of developmental advantage for children.
33. Multivariate analyses confirmed these effects, finding no significant relationship between interventions and parent outcomes, controlling for individual and household characteristics.
34. An "opened case" of child abuse or neglect is a report of abuse or neglect for which there is enough confirming evidence to support an official case file and a complete investigation by child protective services. Not all opened cases are subsequently substantiated in the investigations. Given the considerable length of time that cases often remain open, it was not possible to determine substantiation during the demonstration period.
35. A similar analysis of ethnic group differences was not conducted for the Teen PAT Demonstration because the ethnicity of mothers in that demonstration project was seriously

confounded with the local programs that served them. For example, virtually all African-American teens were recruited from a single program; a majority of Caucasian teens were recruited from one other program. This made it impossible to distinguish the influence of individual site differences from that of ethnicity.

36. A series of multivariate analyses were conducted that statistically controlled for the effects of the mother's education, age, primary language, and self-reported experience with infants at enrollment; household income; and the child's gender to determine whether the dissolution of marriage during the demonstration project had an effect on each of the outcomes for children. See note no. 32 for detailed descriptions of these analyses and results.
37. Parents as Teachers National Center. *Parents as Teachers birth to three. Program planning and implementation guide*. Rev. ed. St. Louis, MO: PATNC, 1992. It is important to note that PATNC recommends that 17 specific lessons be delivered, not just that 17 nonspecific visits occur. However, these analyses did not take visit content into account, but rather focused solely on whether parents received 17 visits.
38. In the Salinas Valley PAT Demonstration, these included the mother's ethnicity, primary language, education, age, and reported level of knowledge of infants; the child's gender and child care arrangement; household income; and whether the mother had been divorced since enrollment. In the Teen PAT Demonstration, control factors included the mother's ethnicity, age, high school completion status, and pregnancy status at enrollment; the program in which the family was enrolled; whether the mother was currently enrolled in school or job training or was working; and whether the mother had been pregnant again since enrollment.
39. See, for example, Hauser-Cram, P., Pierson, D.E., Walker, D.K., and Tivnan, T. *Early education in the public schools: Lessons from a comprehensive birth-to-kindergarten program*. San Francisco: Jossey-Bass Publishers, 1991; Powell, C., and Grantham-McGregor, S. Home visiting of varying frequency and child development. *Pediatrics* (1989) 84:157-64. See also note no. 11, Pfannenstiel and Seltzer and Pfannenstiel, Lambson, and Yarnell.
40. See, for example, Love, J.M., Nauta, M.J., Coelen, C.G., et al. *National Home Start evaluation: Final report. Findings and implications*. Report by High/Scope and Abt Associates to the Department of Health, Education, and Welfare. Washington, DC: U.S. Government Printing Office, 1976; Burkett, C.W. Effects of frequency of home visits on achievement of preschool students in a home-based early childhood education program. *Journal of Educational Research* (1982) 1:41-44; and Gray, S.W., Ramsey, B.K., and Klaus, R.A. The Early Training Project. In *As the twig is bent . . . lasting effects of preschool programs*. Consortium for Longitudinal Studies, ed. Hillsdale, NJ: Erlbaum, 1983.
41. Gomby, D.S., Larner, M.B., Stevenson, C.S., et al. Long-term outcomes of early childhood programs: Analysis and recommendations. *The Future of Children* (Winter 1995) 5,3:6-24, p. 12.
42. Olds, D.L., and Kitzman, H. Review of research on home visiting for pregnant women and parents of young children. *The Future of Children* (Winter 1993) 3,3:53-92.
43. Barnes, H.V., Goodson, B.D., and Layzer, J.I. *National evaluation of family support programs: Review of research on supportive interventions for children and families*. Vol. 1. Cambridge, MA: Abt Associates, 1995, p. 3-17; see also Scarr, S., and McCartney, J. Far from home: An experimental evaluation of the Mother-Child Home Program in Bermuda. *Child Development* (1988) 59:248-53.
44. The national multisite study is being funded by a public-private partnership that includes the Office of Educational Research and Improvement of the U.S. Department of Education, The Robert Wood Johnson Foundation, and The Smith Richardson Foundation. The Carnegie Corporation of New York provided funding for the study design. The evaluation is being conducted by SRI International in collaboration with the Parents as Teachers National Center.