

A Follow-Up Study of Parent Education in Pediatric Office Practices: Impact at Age Two and a Half

ROBERT W. CHAMBERLIN, MD, AND EMILY K. SZUMOWSKI, BA

Abstract: The relationship between physician efforts to educate mothers of first born children about child behavior and development, and various outcome measures of mother and child functioning has been extended from 18 months to a time period of two and a half years.

As was found earlier, there was a modest relationship between physician effort and mother gain in knowledge about child development, her feeling of being supported by the practice in her child-rearing role, and the frequency of her participation in affectional and cognitively stimulating activities with her child. These relationships, however, did not significantly increase in strength over time. At the end of 30

months there were still no significant positive relationships between teaching input and the child's developmental status, and mothers receiving care from physicians who taught more continued to report more behavior problems with their child than mothers receiving care from physicians who taught less.

A content analysis of a small sample of the visits of high and low scoring physicians indicated that neither focused their teaching efforts on ways that mothers could interact with their children in more affectionate and cognitively stimulating ways. It is suggested that more focused teaching in this area might lead to better child development outcomes. (*Am J Public Health* 1980; 70:1180-1188.)

Introduction

This is a follow-up report of a longitudinal study investigating the relationships between pediatricians' efforts to educate new mothers about child behavior and development and various outcome measures of mother and child functioning over time.¹

Our original hypothesis was that mothers would learn more from physicians who made a greater effort to teach and that mothers who knew more about child development would have fewer concerns about and conflicts with their children, spend more time in positive contact with them, and have children functioning at a more advanced level of social and cognitive development.

The first report of the study covered the time period from the birth of the child to age 18 months.¹ It was found that physicians' teaching efforts were related to gains in mother knowledge over this time, to her use of positive contact with her child, and to her feeling of being supported by the physician in her child-rearing role. The measure was not, however, related to the number of mother's reported concerns about and conflicts with the child or to the child's developmental status. There was also a weak but significant positive relationship between teaching effort and the mother's report of the number of child behavioral problems she was experiencing.

It was thought that the failure to demonstrate a direct positive effect of physician teaching efforts on the child's developmental status might have been due to the small amount of time spent with the mother by even the high input group of physicians in comparison to the one or two hours a week spent with the mother in the home in programs that have shown direct effects on child development.²⁻⁴ However, because pediatricians have continued contact with parents over long periods of time, the effects of their teaching efforts may become more apparent as time passes. To explore this possibility, a follow-up study of mother and child functioning over a further year was carried out, through child age 2-1/2. Our basic hypothesis was that if these relationships were related to physician teaching input, they should all increase in strength over this time period. The purpose of this paper is to report the results of this follow-up study. In addition, further information on the validity of our classification system for physician teaching effort will be presented by comparing the actual content of well-child visits of high vs low-scoring physicians.

Methods

The population, sample, and measures used in this follow-up report are similar to those described more fully previously and will be presented only briefly here.¹ Time 0 refers to measurements made around the time of the birth of the child, Time 1 to those made at one year, Time 2 at 18 months, Time 3 at two years, and Time 4 at 30 months. The timing of various assessment procedures are shown in Table 1.

Address reprint requests to Robert W. Chamberline, MD, Associate Professor of Pediatrics, University of Rochester Medical Center, 601 Elmwood Avenue, Box 777, Rochester, NY 14642. This paper, submitted to the *Journal* January 30, 1980, was revised and accepted for publication June 23, 1980.

TABLE 1—Timing of Assessment Procedures

Measures	Newborn Time 0	1 year Time 1	18 months Time 2	2 years Time 3	30 months Time 4
Physician Teaching Status	X				X
Mother Functioning Knowledge	X	X		X	
Mother Functioning Attitudes		X		X	
Mother Functioning Child Rearing Style		X		X	
Child Functioning Behavior Problems and Patterns		X		X	
Developmental Status			X		X

Sample

Physicians: At the beginning of the study, an attempt was made to elicit the cooperation of all full-time, private practice, fee-for-service pediatricians in the city and suburbs of Rochester, New York. Thirty-five (80 per cent) agreed to participate. Sixteen of these physicians practiced in four group settings with pediatric nurse practitioners (PNPs), 12 in four groups without nurse practitioners, and seven were in solo practice.

Mothers and Children: Over a one-year time period, 595 new mothers of first-born children were recruited from these practices to participate in the study. At the end of Time 4, when their children were 30 months old, 440 mothers (74 per cent) remained in the sample. Of the 155 mothers who had dropped out of the study at various points, 44 per cent were known to have moved out of the area or could not be located, and 20 per cent had switched to other pediatricians not participating in the study before the child was age two. Another 10 per cent refused to continue the study at some point, and 22 per cent claimed a willingness to participate but their questionnaires were never received. The remaining four per cent were lost for a variety of reasons, including three infant deaths.

Of the 440 mothers who completed the data collection at Time 4, another 69 were not included in the final data analysis because 21 switched to another non-participating practice after the child was two, 34 switched from one participating practice to another, and 14 had some missing data in one or more data sets. The data presented here then are for the 371 mothers who have a complete data set and have maintained contact with the same practice for the entire two and a half years of the study.

In Table 2, the demographic characteristics of this group are compared with those of the original sample and with the 224 families not included in the final analysis.

The mothers remaining in the study were significantly older, were better educated, knew more about child development, and were of higher socioeconomic status than those not included in the final analysis. However, there were no significant differences between the two groups in the types of practices they came from (solo, group with PNP or without

the PNP), or in the teaching score of the practices from which they received their initial well-child care.

Because mothers did not drop out of the study at different rates from practices with different levels of teaching or with different structures, it seems unlikely that their loss has severely distorted the findings concerning the effects of different levels of physician educational efforts. However, the increasing sophistication of the mothers remaining in the sample as the study progressed probably decreased the variability of their responses as a group, making any relationships more difficult to demonstrate.

The 34 mothers who switched from one to another of the participating practices during the study did not appear to be following a pattern in switching to or from practices with high or low teaching scores. Also, mother education level, initial level of knowledge about child development, age, and socioeconomic class were not related to the teaching status of the old or new pediatric practices.

Measures

Physician Teaching Efforts: Twenty-three of the participating physicians (each in solo practice and the two seeing the most newborns in each group practice) were interviewed at the beginning of the study about their use of specific techniques to teach new mothers about child behavior and development. These physicians were providing care for approximately 80 per cent of the mothers at each time period. The use of the following techniques was investigated: planned, explanatory discussions; handouts; book recommendations; slide-tape presentations; educational waiting room displays; extra visits for special problems; telephone call hours; mother group meetings; office reference libraries; and professional mental health associates.

Each physician was assigned a teaching score according to the extent to which these techniques were used regularly.* The average score for each practice was calculated, and the sample of practices was divided roughly into thirds (high, medium, low teaching effort) on the basis of these scores.

At the conclusion of the study, one of these pediatricians had moved out of state, but the remaining 22 pediatricians were reinterviewed and asked to describe their current

TABLE 2—Demographic Characteristics of Families

	Original sample (N = 595)	Final sample (N = 371)	Others (N = 224)
Sex of Child			
Male	50.9%	50.7%	51.3%
Female	49.1	49.3	48.7
Age of Mother at Birth of Child			*
Mean	24.9 yrs.	25.4 yrs.	24.0 yrs.
Std. Dev.	3.6	3.4	3.9
Education Level of Mother at Birth of Child			*
Mean	13.9 yrs.	14.1 yrs.	13.4 yrs.
Std. Dev.	2.1 yrs.	2.0 yrs.	2.1
Mother's Religion			
Catholic	50.9%	50.1%	52.2%
Protestant	32.6	33.4	31.3
Jewish	5.7	7.0	3.6
Other	3.2	2.4	4.5
None	7.6	7.0	8.5
Hollingshead Social Class of Father			*
(High) 1.	11.5%	12.5%	9.8%
2.	24.3	27.2	19.2
3.	27.2	26.7	28.0
4.	32.4	29.7	36.9
(Low) 5.	4.6	3.8	6.1
Mother's Knowledge of Child Development/Development at Time 0			*
Mean	32.0	32.7	30.9
Std. Dev.	4.2	4.0	4.3

*Significantly different ($p < .05$) than final sample

use of the same techniques. Teaching scores assigned on the basis of the first interviews were highly correlated with those from the second ($r = .80$) indicating that the physicians' teaching effort had not changed much over the three-year period.

To obtain further information on the validity of this measure, tape recordings were made of three or four well-child visits apiece for four high-scoring and four low-scoring pediatricians (13 visits for the high-scoring physicians and 14 visits for the low). The visits were with first-born infants between the ages of six and nine months inclusively. The educational "climate" of each visit was quantified by counting the number of statements made by the physician which were used to: a) educate the mother or suggest courses of action to her; b) assess the child's behavioral development and (indirectly) find out if further education in specific areas is necessary; and c) indicate to the mother that the physician is open to questions. Scoring was limited to topics concerning child behavior and development (broadly interpreted), excluding discussion of physical growth, nutrition, illness, and other medical problems. Scoring of the tapes was done blindly and independently by each of the authors. Correlation between the scores assigned by each author for the 27 visits was $r = .79$.

The average number of educational statements per visit was calculated for each physician and correlated with the teaching scores assigned at the beginning of the study ($r =$

$.64$, $p < .05$). In addition, the pediatricians designated as "high-scoring" in their original teaching differed significantly from the "low-scoring" pediatricians by using a greater average number of educational statements in the recorded visits (28.7 vs 11.0; $t = 3.87$; $df = 6$; $p < 0.01$). This shows that the original scores derived from interviews with the pediatricians reflect real differences among the pediatricians which are manifested during their well-child visits.

A content analysis of the well-child visits of the four high and the four low scorers revealed that the highs do considerably more teaching about stage-related behavior, individual differences, and the management of common behavioral problems than the lows.

Most of the time spent on developmental issues by lows was in the form of inquiries about the attainment of various developmental milestones with an occasional bit of teaching about stage-related behavior and the management of an eating or sleep problem.

The greater time spent discussing behavior problems by highs appeared to be in response to issues brought up by the mother during a more detailed inquiry about the child's behavior and development.

Neither highs nor lows talked much about the importance for development of affectionate and cognitively stimu-

*Scoring system available from the authors.

lating interactions between parents and child. Also, neither inquired much about the mother's current life situation, her role satisfaction or whether or not she was receiving adequate support from husband, family and friends.

The usual frequency of scheduled well child visits for each practice was not obtained, but the prevailing practice for this area is five or six visits for the first year and two to four visits for the second.

Mother Functioning

Knowledge of Child Development: An alternate form (B) of the original 45-item questionnaire (Form A) was developed to test mothers' knowledge and avoid possible learning effects from administering the same questionnaire three times in a row. As a content check, a group of 12 non-participating pediatricians answered the questions on Form B and, as expected, scored significantly higher than did mothers in the study at Time 3 ($x = 41$ vs $x = 36$, $t = 10.14$, $df. = 457$, $p < 0.001$). For the mothers, the correlation between scores on Form A at Time 1 and Form B at Time 3 was $r = 0.65$.

Attitudes: As before, each mother rated her perception of: 1) the child's overall development (3 = above average . . . 1 = below average); 2) how difficult the child had been to rear (4 = very difficult . . . 1 = easy); 3) whether or not she thought the child had a behavioral or emotional problem (0 = no, 1 = mild . . . 3 = severe), and how much help she had received from her pediatrician or nurse practitioner in understanding and managing the behavior and development of her child (4 = a great deal . . . 1 = none). In addition, information was obtained on the number of mother concerns and perceived parent-child conflict areas from the child behavior checklist described below.

Child-rearing Style: A questionnaire similar to that used at Time 1 was administered to ascertain the frequency with which the mother engaged in a number of activities with her child. As before, these activities were divided into two groups describing use of positive contact (affectionate and intellectually stimulating types of activities) and negative contact (restricting, scolding, or punishing the child).

Child Functioning

Behavior Patterns and Problems: A checklist similar to that used at Time 1 was filled out by the mother at Time 3. This checklist consisted of a number of statements about typical child behaviors which the mother rated according to how well (very = 2, somewhat = 1, or not at all = 0) they described her child's current behavior. After each behavior, the mother was also asked to indicate whether it was causing her any concern or leading to frequent parent-child conflicts. Points assigned for different combinations of items were summed to produce the following scores for behavior problems at Time 3: eating, sleeping, toilet training, sexuality, parent-child relationships, personality traits, and a summation of these into a total problem score. In addition, items were grouped and scored for the following behavioral patterns: aggressive-resistant, dependent-inhibited, and friendly-outgoing. For each of these measures, higher scores indicate more of the behavior in question.

Child Developmental Status: At Time 4, the child's developmental status was ascertained on an abbreviated version of the Minnesota Child Development Inventory (MCDI).^{5,6}

Data Analysis: To correct for differences in socioeconomic status, mother education level, and mother initial knowledge of child developmental among the patient populations of the different pediatric practices, analyses of covariance were used where appropriate to partial out the effects of these variables. The SPSS ANOVA program was used for these.⁷

Because the measure used to assess mother knowledge, attitudes, and behavior, and child behavior and development were not strictly comparable across time, analyses of changes in these variables were performed using scores standardized at each point in time. Thus, for example, a mother's standardized knowledge score would represent her performance on the mother knowledge questionnaire relative to that of all the other mothers who completed the questionnaire at that particular time in the study.

Except where otherwise indicated in the Tables, vari-

TABLE 3—Intercorrelations between Variables Based on Mother Reports and Demographic Factors

Mother and Child Variables	Mother				Child			
	Years of Education	Knowledge T ₃	Pos. Cont. T ₃	Neg. Cont. T ₃	Child Difficult T ₃	Sex	Total Symptom Score T ₃	General Development T ₄
Years of Education	—	.51**	.32**	-.24**	-.02	.08*	.04	.12*
Child Knowledge T ₂		—	.34**	-.18**	.00	.02	.10*	.06
Child Positive Contact T ₃			—	-.05	-.04	.01	.05	.45**
Child Negative Contact T ₃				—	.25**	-.10*	.29**	-.08
Child Child Difficult T ₃					—	-.08*	.34**	-.07
Mother Sex						—	.05	.29**
Mother Total Symptoms T ₃							—	.04
Mother General Develop T ₄								—

*p ≤ .05
**p ≤ .01

ables were scaled such that a high score indicates a greater degree of the quality described in the variable name.

Results

Consistency of Measures over Time

Variables that were most consistent over a one-year time period were the child's developmental status ($v = .66$), mother knowledge of child development ($r = .65$), mother perception of being helped by the practice ($r = .60$), mother perception of how difficult her child was to rear ($r = .57$), mother use of positive contact ($r = .56$), and the child's overall behavioral problem score ($r = .53$).

Least consistent were the number of concerns ($r = .34$) and conflicts ($r = .28$) reported by the mother; the eating problem score of the child ($r = .37$), and the measures of friendly-outgoing ($r = .35$) and aggressive resistant ($r = .38$) behavior patterns of the child.

Interrelationships between Variables

Because mother and child outcome measures were both based on mother reports, there is a possibility that any relationships found between measures might be from a "halo"

effect in which the mother sees everything in a positive or negative light. However, the pattern of correlations shown in Table 3 indicates that this is not happening.

As can be seen in Table 3, correlationship between the total behavioral problem score and the child's general development status is only $r = .04$ indicating that whether or not a mother reports her child as having behavioral problems does not influence her response to the developmental questionnaire. In addition, while mothers' reported use of positive contact is strongly correlated with the measure of child developmental status, her report of use of negative contact is not. Similarly, child sex is significantly related to the measure of child development but not to the total behavioral problem score. Finally, mother knowledge of child development is significantly correlated with her use of positive contact but not with the child's developmental status.

Are Time 1 Relationships Still Present at Time 3?

Relationship with Physician Teaching Status: Table 4 presents the results of a one-way analysis of covariance relating physician teaching status to various outcome measures of mother and child functioning after controlling for the mother's years of education, her knowledge of child de-

TABLE 4—Relationship between Physician Teaching Status (Time 0) and Mother and Child Outcome Measures at Time 3 and Time 4 (N = 366)

Outcome Measures	Adjusted Mean Scores by Physician Teaching Status*			Explained Variance					
	Low (N = 107)	Medium (N = 96)	High (N = 163)	Covariate		Main Effect		Total	
				R ²	p	R ²	p	R ²	p
Mother = (T₃)									
1. Knowledge of development	35.1	35.4	36.5	0.44	(.00)	0.02	(.00)	0.46	(.00)
2. Use of positive contact	70.6	71.8	73.2	0.12	(.00)	NS		0.13	(.00)
3. Use of negative contact	26.4	26.1	25.2	0.06	(.00)	NS		0.07	(.00)
4. Attitudes									
a. How difficult to rear	1.9	2.0	2.0	NS		NS			NS
b. Child's overall functioning	2.6	2.4	2.4	NS		0.02	(.01)	0.03	(.04)
c. Feels helped by MD (& PNP)	2.1	2.5	2.8	NS		0.09	(.00)	0.10	(.00)
d. Number of concerns	1.4	1.8	1.9	0.03	(.02)	NS		0.03	(.03)
e. Number of conflicts	1.0	1.1	1.4	NS		NS			NS
Child									
1. Behavioral problems (T ₃)									
a. Eating	3.5	3.5	3.7	NS		NS			NS
b. Sleeping	2.1	2.0	2.2	NS		NS			NS
c. Toilet training	5.4	5.8	6.0	NS		NS			NS
d. Sex	0.2	0.1	0.1	NS		NS			NS
e. Sibling relationships	2.7	2.8	3.5	NS		NS			NS
f. Peer relationships	3.9	4.0	4.1	NS		NS			NS
g. Parent relationships	8.8	9.2	9.2	NS		NS			NS
h. Personality traits	5.1	5.1	6.2	NS		0.03	(.00)	0.04	(.02)
i. Total symptom score (no sibs)	28.9	29.8	31.4	NS		0.02	(.03)	0.03	(.04)
2. Behavior patterns (T ₃)									
a. Friendly-outgoing	8.9	8.9	8.7	NS		NS		0.03	(.05)
b. Aggressive-resistant	4.6	4.6	5.0	NS		NS			NS
c. Dependent-inhibited	3.6	3.8	4.1	NS		NS			NS
3. Development (T ₄)	87.8	86.6	86.6	NS		NS			NS

*One way analysis of covariance by average teaching score per practice (high, medium, low) with three covariates: mother years of education, mother knowledge of child development at birth of child, father's Hollingshead SES Score.

velopment at the birth of the child, and the father's socioeconomic status.

As was true at Time 1, physician teaching status was significantly related to the mother's level of knowledge and her feeling of being helped by the practice. At Time 1, physician effort had also been significantly related to the mother's use of positive contact, but at Time 3 this relationship is no longer significant ($p = .07$).

The puzzling relationships between teaching score and child behavior problems which appeared at Time 1 continue to be significant at Time 3. Mothers attending the practices of high-scoring pediatricians reported more personality trait problems in their children and more total symptoms than did the other mothers. These mothers also rated their children lower on overall functioning and on friendly-outgoing behaviors (which was not true at Time 1). However, the amount of variance explained by these variables remains quite small.

As at 18 months, there was no direct relationship between physician teaching and child's overall development at 30 months.

Relationship of Mother Knowledge to Outcome Measures: Our original hypothesis was that mothers with more knowledge about child development would have fewer concerns about and conflicts with their children, feel their children were easier to rear, spend more time in positive contact with them, and have children functioning at a more advanced level of social and cognitive development. After controlling for socioeconomic status and mother education level, the only part of this hypothesis to receive support at Time 1 was the predicted relationship between mother knowledge and her use of positive contact ($r = .11, p < .05$). At Time 3 this relationship was again significant, and somewhat stronger ($r = .21, p < .01$), but, as before, it was the only part of the hypothesis receiving support. In addition, there were a number of significant but weak relationships with mother knowledge and her reporting of behavior problems with her child, including eating ($r = .10, p < .02$), toilet training ($r = .16; p < .01$), peer ($r = .11; p < .02$) and parent relationship problems ($r = .10; p = .02$), and troublesome personality traits ($r = .10; p < .02$). There were no significant relationships between mother knowledge at Time 3 and the child's developmental status at Time 4.

Prediction of Child Developmental Status: The best predictors of the child's developmental status at age 18 months were the mother's reported use of positive contact with the child at one year of age and the child's sex. To examine these relationships with the child's developmental status measured at 30 months, mother and child variables operating at birth, one year, and two years were entered into a hierarchical stepwise regression equation. The detailed results of this are shown in Table 1 in the Appendix. The total equation accounts for more than 40 per cent of the total variance in development. As was found previously, the strongest predictors of developmental status were the mother's use of positive contact and the child's sex. Positive contact at 24 months exerted a strong independent influence on development even after accounting for the effects of positive contact at 12 months (which were also strong). Other variables contributing to developmental status were the child's age at the

time of testing, mother's age and religious orientation, and family socioeconomic status. Surprisingly, mother's knowledge of child development at Time 1 was negatively related to the child's developmental status. The effect of physician teaching was not significant.

Prediction of Mother Use of Positive Contact: Since positive contact was found to be an important predictor of the child's development at both 18 and 30 months, the antecedents of this at Time 3 were explored. The detailed results of the hierarchical stepwise regression are summarized in Table 2 in the Appendix.

The variables included explained 37 per cent of the total variance. The most important of the predictors was the child's developmental status at 18 months, with mothers of more advanced children reporting greater use of positive contact six months later. Variables concerned with education played a much greater role in explaining use of positive contact than in explaining the child's developmental status: mother's knowledge at Time 3, the extent of her reading about child development before the child's birth, and her education level, as well as her pediatrician's teaching efforts and her rating of the amount of help from the pediatric practice, all explained significant portions of variance in the use of positive contact. In addition, the child variables of friendly-outgoing behavior at Time 1 and dependent-inhibited behavior and low symptom score at Time 3 contributed significantly. These findings concerning the prediction of positive contact at Time 3 are in general agreement with those at Time 1.

Do the Observed Relationships Increase in Strength over Time?: In view of the long-term contact between pediatricians and mothers and between mothers and their children, it is interesting to investigate whether the relationships from both Time 1 and Time 3 data become stronger over the one-year period. Figure 1 presents a graph and data describing the effects of teaching on mother knowledge, the variable with the most striking relationship with time.

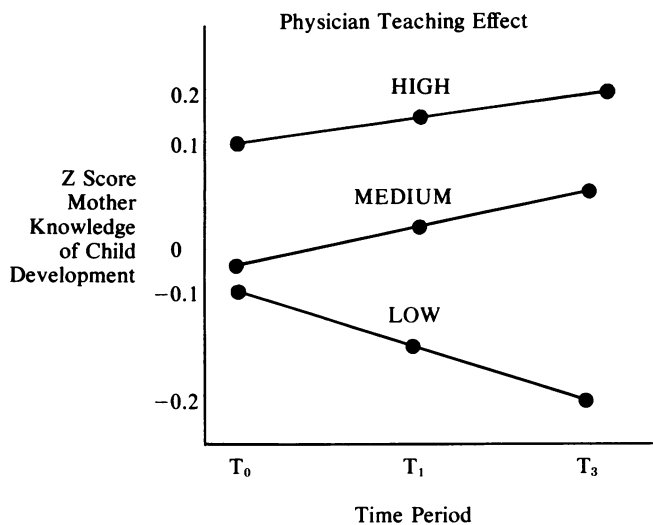


FIGURE 1—Relative change in mother's knowledge of child development over time according to level of physician teaching effect with mother. Level of Education Covaried. (N + 351)

In this variable, as was found in the other ones examined (mothers' perception of being helped, use of positive contact, and total symptoms score), the standardized scores on the dependent variables changed in a way that was consistent with the hypothesis that the relationships were increasing in strength over time. For example, mothers attending pediatric practices with low teaching scores received knowledge scores that were worse and worse over time relative to the other mothers in the sample, while mothers attending practices with high teaching scores received knowledge scores that were relatively better and better.

However, when the amount of this divergence was examined by looking for interaction effects between teaching score and time for this variable, it was not significant. The trends over time for the other variables were less marked than this. Thus, none of these relationships increased significantly over time.

Implications: These follow-up data provide additional support for the hypothesis that physician teaching efforts in well-child visits do have some effects on the mother's knowledge of child development and her feelings of being supported in her child-rearing role. Since social support has been shown by others to be an important protector against a variety of health consequences related to life stress and an important ingredient in preventing child abuse and neglect, its significance should not be underestimated.⁸⁻¹⁰ Having knowledge of child development, however, does not seem to make child-rearing any easier for the mother or to lead to a more advanced state of development for the child. What the mother actually does in terms of interacting with the child in an affectionate and cognitively stimulating way appears to be far more important: measures of the mother's use of positive contact at both ages 1 and 2 are the best predictors of the child's developmental status at age 30 months.

Although the measure of physician teaching effort explains a small but significant portion of the variance in the regression equation predicting the mother's use of positive contact, it is not a strong enough effect to show up as a direct relationship between physician teaching effort and the child's developmental status. Furthermore, the effect does not increase significantly over time. The content analysis of a small sample of visits suggests that even the high teaching physicians do not spend much effort directly focused on teaching mothers to interact with their child in more affectionate and cognitively stimulating ways.

In a recent report it has been shown that physician teaching focused directly on the area in regular well-child visits can influence a mother's interaction with her infant enough to show effects on at least one measure of child development.¹¹ It seems likely, then, that the effect of well-child visits on promoting child development could be significantly enhanced by teaching physicians how to do this better.

The fact that mothers receiving more teaching input described more problem behaviors in their children is an interesting finding that needs clarification. Does physician receptiveness and teaching simply make a mother more realistic and a better reporter of her child's negative behavior or does it make the mother less sure of herself and less consistent in

her child-rearing techniques which, in turn, leads to more problems? Gutelius, *et al*, found a decrease in behavior problems in the children of mothers receiving a special program of guidance through the first three years of the child's life.¹² The major differences noted were in toilet training, awakening at night, shyness, and the total number of problems reported. Cullen, on the other hand, reported both positive and negative associations.¹³ In his study, children receiving extra guidance had fewer behavior problems in the home, but had more problems in school. These studies point up the importance of looking for negative as well as positive effects of intervention programs.

The importance of the physician and others as part of the mother's support system is also receiving increasing attention.⁸⁻¹⁰ High scoring physicians in this study were seen as more supportive by the mothers than the low scoring ones. However, the fact that content analyses of visits with both high and low scoring physicians revealed little inquiry about what was going on in the mother's current life situation suggests that this role could also be improved upon.

Physicians are in a strategic position to provide emotional support to parents with young children and help them learn how to interact with their children in an affectionate and cognitively stimulating way. Our data suggest that physician training in both these areas could stand improvement.

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APPENDIX

TABLE A-1—Summary of Stepwise Regression Equation Predicting Child's General Development at 30 Months (N = 357)

	Multiple r	Multiple r sq.	RSQ Change	Simple r	B	F Value
Step 1 (At birth)						
Sex (1 = male, 2 = female)	.28	.08	.08	.28	.23	27.18**
Age, (Mother)	.29	.08	.00	-.04	-.11	5.40**
Education (Mother)	.31	.10	.02	.11	NS	0.06
Religious orientation (1 = Cath., 0 = Non-Cath.)	.32	.11	.01	.08	.07	2.36**
Took childbirth classes	.32	.11	.00	.00	NS	0.50
Read books on child care	.33	.11	.00	.06	NS	0.48
Previous experience with small children	.33	.11	.00	.02	NS	0.00
Mother knowledge, T ₀	.34	.11	.00	.01	NS	0.53
SES (higher scores for lower status)	.34	.12	.01	-.11	-.09	2.47**
Step 2						
Physician teaching score	.34	.12	.00	.02	NS	0.05
Step 3 (One year)						
Mother knowledge, T ₁	.35	.12	.00	-.02	-.10	2.42**
How difficult to rear	.35	.12	.00	-.06	NS	0.01
Help from MD & PNP	.36	.13	.01	.09	NS	0.00
Child's perceived overall functioning	.43	.18	.05	.24	.07	2.00**
Total symptoms	.43	.18	.00	-.02	NS	0.17
Friendly-Outgoing	.45	.20	.02	.19	NS	0.11
Aggressive-resistant	.46	.21	.01	-.05	NS	1.15
Dependent-inhibited	.46	.21	.01	-.01	NS	0.58
Mother use of positive contact	.59	.35	.14	.46	.27	25.29**
Step 4 (Two years)						
Mother use of positive contact	.63	.40	.05	.45	.28	26.09**
Mother knowledge, T ₃	.63	.40	.00	.05	NS	0.85
How difficult to rear	.64	.40	.00	-.09	NS	0.02
Help from M.D. & PNP	.64	.40	.00	.01	NS	0.01
Child's perceived overall functioning	.65	.42	.02	.37	.13	5.95**
Total symptoms	.65	.42	.00	-.05	NS	0.00
Friendly-outgoing	.65	.42	.00	.23	.09	3.36**
Aggressive-resistant	.65	.43	.01	-.01	.08	1.56*
Dependent-inhibited	.65	.43	.00	.01	NS	0.49
Step 5 (30 months)						
Child's age at time of testing	.66	.43	.00	.05	.06	1.80**

*p < 0.05

**p < 0.01; overall F value for complete equation = F = 8.50, df = (29,327), p < .01.

TABLE A-2—Summary of Stepwise Regression Equation Predicting Mother Use of Positive Contact at Time 3 (child age two years) (N = 357)

	Multiple r	Multiple r square	RSQ Change	Simple r	β	F Value
Step 1 (at birth)						
Sex	.05	.00	.00	.05	-.06	1.70*
Mother's Age	.19	.03	.03	.18	.07	2.05**
Mother's Ed. (yrs)	.32	.10	.07	.32	.13	3.99**
Catholic, non-Catholic	.32	.10	.00	-.06	NS	0.09
Classes	.32	.10	.00	.04	NS	0.79
Reading	.35	.12	.02	.19	.15	10.81**
Experience	.35	.12	.00	-.04	NS	0.76
Knowledge, T ₀	.36	.13	.01	.24	NS	0.05
Socioeconomic Status	.36	.13	.00	-.23	NS	0.30
Step 2						
Teaching Score	.38	.14	.01	.18	.06	1.71*
Step 3 (one year)						
Knowledge, T ₁	.39	.15	.01	.26	NS	0.02
How difficult to rear	.39	.15	.01	.26	NS	0.02
Help from MD & PNP	.40	.16	.01	.11	NS	0.04
Overall functioning	.43	.18	.02	.17	NS	0.34
Total symptoms	.43	.18	.00	.01	NS	0.03
Friendly-outgoing	.46	.21	.03	.23	.12	6.34**
Aggressive- resistant	.46	.22	.01	-.06	NS	0.00
Dependent- inhibited	.47	.22	.00	.06	NS	0.15
General development	.57	.33	.11	.37	.37	46.16**
Step 5 (Two years)						
Knowledge, T ₃	.59	.35	.02	.34	.22	11.74**
How difficult to rear	.59	.35	.00	-.04	NS	0.42

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