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Reading Research Quarterly, Vol. 29, No. 4 (Oct. - Nov. - Dec., 1994), 382-401.

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Joining together in literacy learning: Teenage mothers and children

Literacy learning is a process that has its roots in the home, beginning in infancy with the child's exposure to oral and written language (Goodman, 1986; Hiebert, 1988; Teale, 1986). Through numerous demonstrations and interactions with parents and caregivers, children begin to construct knowledge about and strategies for using print. Case studies attest to the profound role that extended parent-child interactions around print play in children's literacy development (Baghban, 1984; Clark, 1984; Lass, 1982). Such interactions seldom involve direct, formal instruction; rather, through jointly constructed experiences, children master a set of sustained patterns which serve as a basis for their subsequent acquisition of written language (Heath, 1983; Snow & Goldfield, 1982). In Vygotsky's (1978) notion of the zone of proximal development, children are seen as internalizing the processes practiced through participation with adults to advance their individual skills. For Vygotsky, the fundamental vehicle of social transaction provides children with opportunities to participate beyond their own abilities in a shared thinking process, appropriating what they contribute in these experiences for later use.

Studies exploring the nature of parent-child interactions in literacy learning have focused, to a large extent, on storybook-reading activity in the home (Edwards & Panofsky, 1989; Ninio & Bruner, 1978; Snow & Goldfield, 1982; Yaden, Smolkin, & Conlon, 1989). Such studies describe how parents may assist children's learning by inventing routines that help to control children's

focus of attention, match tasks to their abilities, and arrange the environment so that the children can solve problems that are a little bit beyond what they could do on their own. While storybook reading is posited as a central vehicle for literacy development, children and their parents also engage in a range of other activities which are literacy embedded. Print mediates many family activities, such as shopping for groceries or paying bills (Anderson & Stokes, 1984). Though such activities are not staged for children's benefit or adjusted to their level of expertise, parents tacitly guide their children's participation in these "socially assembled situations" (Laboratory of Comparative Human Cognition, 1983), initiating them in the standing rules for behavior in a wide variety of social and print-related settings. Thus, a family's influence in children's literacy learning involves far more than the provision of books or leisure-time reading; it also involves the development through shared activities of ways to handle day-to-day print events which work concurrently to enhance children's learning about written language.

This process of guiding children's participation (Rogoff, 1990) presumes intersubjectivity—a sharing of focus and a mutual understanding between people. And it is here that parents seem particularly well placed to play an important teaching role. Sharing the child's world, the parent can facilitate linking new situations to more familiar ones and drawing connections from the familiar to the novel—tasks viewed as essential for cog-

Joining together in literacy learning: Teenage mothers and children

PREVIOUS research suggests that mothers who are teens when they give birth may be ill prepared to engage in literacy interactions tailored to their children's level of understanding. This study examines the effects on their children's literacy play and intellectual development of coaching their mothers to use selected cues in playful literacy explorations. Prior to the intervention, 6 children were administered the Peabody Picture Vocabulary Test (PPVT). Literacy-related play settings were then created in their homes. Mothers were coached to (a) draw attention to and label the objects of interest to children, (b) "scaffold" children's efforts

through demonstrations and modeling, and (c) challenge children's interpretations through responses contingent to the child's previous utterance. After a 6-week period, new materials were provided to measure transfer, followed by a maintenance period with no additional materials or coaching. Graphic analyses indicated increases in the uses of interactional cues following intervention, with scores declining to different degrees during transfer and maintenance phases. Children's active participation in literacy activity increased, and posttest gains on the PPVT were significant.

Se rejoindre dans l'apprentissage du lire-écrire: mères adolescentes et enfants

DES RECHERCHES antérieures suggèrent que les mères qui ont des enfants alors qu'elles sont adolescentes sont mal préparées à s'engager dans des interactions de lecture-écriture adaptées au niveau de compréhension de leurs enfants. Cette étude examine l'effet sur des jeux de lecture-écriture et le développement intellectuel des enfants d'un entraînement de leurs mères à utiliser des indices déterminés, lors d'explorations ludiques en lecture-écriture. Avant l'intervention, 6 enfants ont passé le Peabody Picture Vocabulary Text (PPVT). On a créé à la maison des situations de jeu liés à la lecture-écriture. Les mères ont été entraînées à (a) attirer l'attention sur les objets intéressants pour l'enfant et à les

dénommer, (b) étayer les efforts de l'enfant par des démonstrations et des modèles, et (c) mettre en cause une interprétation par l'enfant en réagissant aussitôt à ce qu'il vient de dire. Au bout de 6 semaines, on a apporté un nouveau matériel pour mesurer le transfert, puis instauré une période de maintenance sans matériel ni entraînement supplémentaires. L'analyse des graphiques a montré une augmentation des indices d'interaction après l'intervention, et des résultats en diminution à différents degrés lors des phases de transfert et de maintenance. La participation active des enfants aux activités de lecture-écriture a augmenté et les gains aux posttests de PPVT ont été significatifs.

Unidos en el proceso de alfabetización: Madres adolescentes y niños

INVESTIGACIONES PREVIAS sugieren que las madres adolescentes podrían estar poco preparadas para promover interacciones a la alfabetización que se adapten al nivel de comprensión de sus hijos. Este estudio propone un programa de entrenamiento que promueva en la madre el uso de recursos para incursionar, de un modo entretenido, en la lectura y la escritura, y estudia los efectos del entrenamiento sobre los juegos de los niños con el lenguaje y su desarrollo cognitivo. Antes de la intervención, se administró el Test de Vocabulario Peabody (PPVT) a seis niños. Luego se crearon en sus hogares, contextos de juego relacionados con la alfabetización. Se entrenó a las madres para que (a) dirigieran la atención y rotularan los objetos de interés de los niños, (b) proporcionarán

andamiaje lingüístico a los esfuerzos de los niños a través de demostraciones y (c) condujeran las interpretaciones de los niños por medio de respuestas contingentes a la emisión previa del niño. Luego de un período de seis semanas, se proporcionaron materiales nuevos para medir la transferencia, seguido por un período de mantenimiento sin materiales adicionales ni entrenamiento. Los análisis gráficos indicaron aumentos en el uso de recursos de interacción después de la intervención; los valores declinaron en distinto grado durante las fases de transferencia y mantenimiento. La participación activa de los niños en las actividades de alfabetización aumentaron y los incrementos en el PPVT, administrado al final de la experiencia, fueron significativos.

Gemeinsames Lesen- und Schreiblernen: Teenager-Mütter und Kinder

FRÜHERE UNTERSUCHUNGEN legen nahe, daß Mütter, die im Teen-Alter gebären, schlecht darauf vorbereitet sind, an der Lese- und Schreiberziehung, die dem Kindniveau angemessen ist, teilzunehmen. Die vorliegende Studie untersucht die Wirkungen, die ein entsprechendes Training der Mütter mit hilfreichen Tips zum Lesenlernen auf das Lesen- und Schreibspielen der Kinder hat. Vor dieser Intervention wurden die Kinder dem Peabody Picture Vocabulary Test (PPVT) zuteilt. Dann wurden bei ihnen zu Hause lese- und schreibbezogene Spielkonstellationen geschaffen. Die Mütter wurden angeleitet, (a) die Interessenobjekte für die Kinder zu benennen und die Aufmerksamkeit auf sie zu lenken, (b) die Bemühungen der Kinder zu stützen durch Darstellungen

und Beispiele und (c) die Interpretationen der Kinder durch Antworten herauszufordern, die gegenüber den vorherigen kindlichen Äußerungen zufällig waren. Nach sechs Wochen wurden neue Materialien bereitgestellt, um die Interaktionen zu messen, gefolgt von einer Stagnationsperiode ohne neues Material oder Intervention. Graphische Analysen zeigten Zunahmen im Gebrauch interaktionaler Taktiken, die auf die Intervention folgten, mit abnehmenden Markierungen hinsichtlich der verschiedenen Zustände während der Transfer- und der Stagnationsperiode. Die verbesserte, aktive Teilnahme der Kinder beim Lesen- und Schreibenlernen und die Resultate nach dem PPVT-Test waren signifikant.

native growth (Tizard & Hughes, 1984). Through their talk and arrangement of the environment, parents may involve children in activities, helping them to participate and observe at a comfortable, but slightly challenging level. Rogoff (1990), in her synthesis of research, argues for the universality of guided participation across all cultures, though such participation varies in means and developmental outcomes.

The cultural variations in guided participation are striking (Laosa, 1980; Norman-Jackson, 1982). Adults living in difficult circumstances may interact with their children but not necessarily in ways that are congruent with children's later success in schooling (Farran, 1982; Heath, 1983). According to Wells (1985), it is through the place and value given to literacy in the everyday activities of the family that social and educational inequality is transmitted from one generation to the next. Ethnographic studies of low-income families (Delgado-Gaitan, 1990; Goldenberg, 1987; Stack, 1974; Whiting & Whiting, 1975), for example, suggest that parents with limited needs for literacy in their workplace and social settings may not nurture or encourage early literacy behaviors displayed by their children. Thus, there is an apparent and potentially serious intergenerational pattern that is established: Parents with low-level literacy skills may not be aware that certain activities, materials, and types of interactions in the home can play an important role in early literacy development, which may ultimately influence their child's interest in and preparedness for school instruction.

Early intervention approaches have been justified not only by the need to provide strategies for helping parents foster literacy (Edwards, 1991; Madden, Slavin, Karweit, Dolan, & Wasik, 1993), but also by the assumption that in hardship conditions like extreme poverty or poor health, caregivers may need regular, ongoing opportunities to engage children in activities that encourage their optimal growth and development (Neuman & Roskos, 1993b; Ogbu, 1987). This may be particularly true for the population that is the focus of our research—teenage mothers. It is estimated that 1 out of every 10 teenage girls in the United States becomes pregnant, and government statistics suggest that early pregnancy tends to be tied to the parent's reduced educational achievement, marginal earning capacity, and welfare dependency (Alan Guttmacher Institute, 1986). Studies of children born of teenage mothers (Berlin & Sum, 1988; Furstenberg, 1976; Furstenberg, Brooks-Gunn, & Morgan, 1987; Hamburg, 1980) consistently report evidence of such children's limited language and problem-solving abilities and significantly lower IQ scores. These children are at higher risk to be born at a lower birth weight, and at higher risk to suffer lifelong

learning disabilities (Baldwin & Cain, 1980). In short, certain by-products of unplanned parenthood—poor prenatal care, lower education, and poverty—are associated with lower cognitive achievement on the part of the child, creating conditions which could lead to the intergenerational transmission of educational and economic deprivation.

Although some observational studies report teen mothers treating their children in a nurturant manner, virtually every study has found such mothers to hold unrealistic expectations regarding their children's development, and to engage the children in relatively non-stimulating tasks (see Anastasiow, 1982; Baldwin & Cain, 1980, for reviews). As a result, successful interventions may need to rest on a multifaceted approach with families, focusing not only on directly stimulating the child but also on educating the parent, by enhancing the quality of parent-child interaction and the caregiving environment. This suggests an intervention that includes both the provision of objects and materials in the home environment reflective of the child's interests and emerging skills (Tomasello & Farrar, 1986) and strategies to enhance communication and to support the extension of children's understanding to new information and activities (Anastasiow, 1982).

In keeping with the perspective that literacy learning is a social process (Vygotsky, 1978), observational studies of mother-child dyads suggest several characteristics of social interaction that appear to be especially relevant in the early phases of literacy acquisition (Ninio & Bruner, 1978; Snow, 1983; Wood, 1986): *labeling*, *scaffolding*, and *contingent responsivity*. It is well established, for example, that the extent to which caregivers encourage attention to objects and label the objects at which infants point is associated with vocabulary size and growth (Adams & Bullock, 1986; Olson, Bates, & Bayles, 1984). As described by Wood (1986), these constructions occur through a kind of "scaffolding dialogue," in which the caregiver, recognizing the child's intentions, responds selectively to the child's gestures and vocalizations using a number of labeling formats (Ninio, 1980). As the task demands become more complex, the mother scaffolds by helping to organize the child's activity, and by breaking down complex tasks into more manageable steps or stages—effectively supporting and augmenting the *child's* interests and limited resources (Tomasello & Farrar, 1986). What is involved here, then, is a process not so much of directing the child but one more akin to contingent responsivity on the part of the adult (Lidz, 1991; Snow, 1983; Wood, 1986). For example, Snow (1983) argues that the more children experience adult speech that is contingent upon their own previous utterance, the greater the facilitation of language acquisition.

Table 1 A description of the sample

Variable	Teenage mother					
	Sarah	Brenda	Kathy	Rhonda	Harriet	Donna
Age	21 years	19 years	19 years	19 years	22 years	20 years
Schooling	12 years	12 years	15 years	10 years	12 years	12 years
Current employment	Part-time secretary	Full-time hairdresser	Part-time secretary/ full-time student	None	None	Full-time computer entry operator
Child's name	Karen	Alison	Amy	Timmy	Bobby	Todd
Child's age	3.8 years	3.2 years	3.8 years	3.6 years	4.3 years	3.9 years
Child's gender	Female	Female	Female	Male	Male	Male
System of support	Single, lives with mother, support from child's father	Single, lives with mother, some support from child's father	Single, lives with mother, no support from child's father	Single, lives with mother, no support from child's father	Married, lives with child's father	Lives with parents, married to man other than child's father, no support from child's father

Several other studies (Wells, 1979; Wood, McMahon, & Cranstoun, 1980) provide empirical support for the importance of contingent responsivity, demonstrating that caregivers who respond contingently to their child's utterances by elaborating, developing, and negotiating about what they mean are more likely to enhance the development of linguistic competence in their child. Noting the important parallels between language and literacy in development (Snow, 1983), we attempted in this investigation to enhance the uses of labeling, scaffolding, and contingent responsivity to facilitate literacy interactions between mother and child.

This study was designed to analyze the effects of a 3-month intervention with six mother-child dyads as they engaged in playful explorations with literacy materials in their homes. Since play requires partners to work together actively to maintain intersubjectivity, the play context was considered especially appropriate for providing children with opportunities to explore literacy-related objects through social interaction and for allowing mothers to guide children according to their increasing level of skill and interest. Our research focused on two hypotheses. First, we hypothesized that teenage mothers could be coached to adopt a more responsive communication style, adjusting their interactions to support and extend their child's own actions in literacy-related play. Second, we believed that modifications in mothers' mediational exchanges could produce greater participation from their children, potentially enhancing their cognitive development. To achieve these two goals, we created a literacy-related play setting in the home of each mother-child dyad, and then coached mothers to draw attention to and label the objects of interest to children,

to scaffold children's efforts through demonstrations and modeling, and to challenge children's interpretations through responses that were contingent on the child's previous utterance. Thus, in contrast to much of the research on mothers' verbal and nonverbal communication and its relation to children's language acquisition in the first year of life (Carew, 1980) as well as to preparedness for schooling and literacy development (Heath, 1983; Wells, 1985), this study examined whether these existing interactive patterns could be enhanced for greater responsivity, and if so, the potential effects on the child's literacy-related activity and cognitive growth.

Method

Subjects

Six mothers who had been teenagers at the time of giving birth and their children participated in the study. The average age of the mothers was 20 years, ranging from 19 to 22; the average age of the children (3 boys, 3 girls) was 3.8, ranging from 3.2 to 4.3. All mothers were Caucasian; 5 of the 6 children were Caucasian, with 1 child born of an African-American father. As Table 1 indicates, there were variations in mothers' years of schooling, employment, living conditions, and support from the child's father. Previous reviews have documented the considerable variability in demographic patterns of adolescent childbearers (Furstenberg, Brooks-Gunn, & Morgan, 1987; Landy & Walsh, 1988). However, the sample also reflected many characteristics of teenage mothers frequently found in recent surveys (Alan Guttmacher Institute, 1986), including low economic status, dependent living arrangements, and limited basic skills.

The following process was used to select subjects. The second author contacted a nonprofit organization offering childbirth classes to pregnant teens and support services to teen mothers, fathers, and other family members. From a total population of 66 for the years 1986 and 1987, the agency provided a list of teen mothers who had participated in the program at two locations in close proximity to the urban campus of the University. Only mothers whose children were between the ages of 3.0 and 4.6 were contacted, since children in this age range would be more likely than younger children to profit from playful explorations with literacy materials. Mothers were then contacted by telephone and asked if they would be interested in participating in a home-based project over a 12-week period. Mothers were told that, to be eligible for the program, they would have to set aside approximately 10 minutes a day to play and read with their children, be audiotaped regularly, and be observed on a regular basis. Several mothers were eliminated due to scheduling difficulties. With the exception of one child who attended nursery school 2 mornings a week during 1 month of the intervention, all the children spent the majority of their time in the company of adults, primarily their mothers or grandmothers.

Initial visits to the homes revealed generally crowded living conditions, with mothers and children living with several family members in small areas. There were few toys or books for children. None of the mothers reported reading regularly to their child.

Intervention design

Recent studies suggest that play experiences with literacy-related objects influence young children's handling, reading, and writing behaviors (Christie & Enz, 1991; Jacob, 1984; Neuman & Roskos, 1990; Roskos, 1987), their uses of literate language (Neuman & Roskos, 1992; Pellegrini, Galda, Dresden, & Cox, 1991), and their functional uses of written language associated with literacy-related themes (Morrow, 1990; Vukelich, 1991). Many of these studies (Christie & Enz, 1991; Morrow, 1990; Neuman & Roskos, 1993b) have concentrated on the ways in which the environment (materials and setting) and adult participation exert a pull on the nature and quality of children's literacy behaviors in play. Though employing different methodological strategies, these studies converge in suggesting that well-designed literacy-related settings and adult scaffolding play an important role in facilitating young children's engagement with written language in the classroom environment.

Preparing literacy materials for social interaction in the home environment, however, required several modifications. First, it was important for the literacy materials and objects to be easily portable, enabling the mother

and child to move from room to room where other routine tasks, like making dinner, might be ongoing. Second, these materials needed to be compact to accommodate crowded living conditions. Third, the literacy-related play materials needed to reflect a real-world context for involvement, providing the grounds for joint interaction where mothers could easily scaffold and extend children's understanding. And fourth, we believed that coaching each mother to be sensitive to her child's perspective was to be preferred over any formal training in workshop form as is traditional in school intervention studies. As defined by Nettles (1992), coaching is a form of teaching that places responsibility for learning in the hands of the learner, while providing feedback, companionship, and other forms of social support. On the basis of these considerations, the following materials and coaching strategies were developed to accommodate the home environment.

Materials. Two literacy-related prop boxes, one created to resemble a post office and one to represent a grocery store, were designed as intervention materials for the study. Each prop box contained books intended to enhance children's ability to label literacy objects along with a sample of the literacy objects themselves, designed to serve as props for play. These objects were selected as concrete representations of literacy activity (e.g., writing a letter). They are described in Table 2.

In a Vygotskian (1967) perspective, symbolic objects provide a foundation, or pivot, used to express meaning; with development, symbolic acts become independent of such material supports and occur internally in representational thought. Objects selected followed the criteria of appropriateness (naturally and safely used by young children), authenticity (a real item in the child's general environment), and utility (usefulness to children in their imitative literacy attempts) established in a previous study (Neuman & Roskos, 1990). For example, the post office prop box contained a copy of *The Jolly Postman* (Ahlberg & Ahlberg, 1986), a book which showed a postal worker making his rounds and distributing letters, postcards, advertisements, and so forth, all designed to demonstrate the communicative functions of letter writing. The box also included a postal worker's hat, blue shirt, mail bag, paper, pencils, pens, stationery, envelopes, and other related objects. Thus, the literacy-related prop boxes were designed to encourage mother-child interactions through reading and through playful engagement with real literacy objects common to everyday activities that occur in a family.

The post office prop box was designed to be used by mothers and children during the intervention phase of the study, and the grocery store prop box during the transfer and maintenance phases.

Coaching strategies

Each mother received three individual coaching sessions in her home. In each session, mothers were encouraged to focus on one of the following interactional strategies:

Labeling. Mothers were encouraged to use a number of different labeling formats in their joint interactions with children. For example, in reading the story or in setting out the literacy objects, they might simply label the object, as in "This is a...." Or they might elicit the labeling of an object by asking their children *what* questions and *where* questions, such as "Where is the envelope?" as these might naturally occur during the course of reading and play. In addition to these techniques, mothers were encouraged to identify objects or words, taking into account functional considerations. For instance, in response to a child's pointing to a postal worker's mail bag, a mother might say: "That's a mail bag. Do you remember when the postal worker brought us some mail in his mail bag and there was a letter for you?" Such explanations were described as serving an important function in addition to simply labeling by helping to expand word boundaries. As noted by Adams and Bullock (1986), in drawing children's attention to aspects of objects and events that might otherwise not be related, mothers might highlight similarities and differences between these objects and events, helping their children to build conventionalized and functionally useful semantic networks.

Scaffolding. In engaging children in playful explorations of literacy, mothers were encouraged to create supported situations in which their children could extend their current skills and knowledge to a higher level of competence. We focused on three key scaffolding functions as described by Wood, Bruner, and Ross (1976): recruiting, modeling and demonstrating, and augmenting children's efforts. First, mothers were encouraged to recruit children's interests by asking open-ended questions such as "Who should we invite to our party," attempting to invoke literacy-related play. We asked that these situations focus on relevant child-related activity, such as planning for a birthday party, or writing to a favorite uncle, to enhance joint participation from mother and child. Second, mothers were asked to model and demonstrate literacy-related tasks, so that the child could become familiar with common print routines, like addressing a letter or sorting mail. And third, we asked mothers to take on aspects of a task, reducing the number of steps so that the child could more effectively manage the activity. For example, a mother might help in writing addresses on the envelopes for the invitations to a party, or help her child deliver some mail. Through each of these scaffolding functions, mothers were asked

Table 2 Literacy prop box materials

<i>Post office prop box*</i>	<i>Grocery story prop box†</i>
a copy of <i>The Jolly Postman</i> (Ahlberg & Ahlberg, 1986)	a copy of <i>Tommy at the Grocery Store</i> (Grossman, 1989)
postal worker's hat	apron
blue shirt	plastic basket
mail bag	grocery bags
mail box	newspaper circular
paper	14 coupons
pencils	"paid" stickers
envelopes	store receipts
stationery	tablets
stickers	pencils
signs: "Come in, we're open," "Sorry, we're closed"	pens
note pads	play money
crayons	store signs
index cards	cash register
stamp pads and stamps	21 empty food containers for breakfast cereals, orange juice, water, milk, butter, eggs, sugar, macaroni and cheese, spaghetti, jello, popcorn, apple juice, pudding, cookies, rice, pasta, oatmeal, sandwich bags, soap

* Used in intervention phase.

† Used in transfer and maintenance phase.

to consider how the play could be structured through guidance to enable their children to successfully participate in the processes of literacy as a meaningful activity.

Contingent responsivity. In tailoring their participation, it was important for mothers to be sensitive to their child's cues and needs in literacy play and to respond in a manner that would enable the child to assume greater responsibility. For this reason, we encouraged mothers to monitor and respond to their child's preceding utterances in a contingent manner. As described by Snow (1983) and Wood (1986), contingent responses include expansions of the content of the child's utterance, clarifying questions which challenge and demand accountability from the child, and answers to the child's questions. For example, if the child asks his mother "Is the post office open yet?" a contingent response might be something like "Yes, it is. Is there something I can do for you?" Thus, instead of switching or redirecting the topic of play or discussion to one of their own choosing, we encouraged mothers to respond to their interpretation of the child's current focus of interest. Previous research (Neuman & Roskos, 1992) in literacy-related play had suggested that contingent responses yielded more sustained dialogue and play sequences of greater complexity.

In this respect, coaching strategies were designed to encourage techniques which have been shown to be important for learning and possibly for cognitive growth.

Table 3 A time-sampling schedule of the study

Tasks	Sessions									
	0-5	6-10	11-15	16-20	21-25	26-30	31-35	36-40	41-45	
Introductory baseline	●-----●									
Labeling intervention			●							
Record behaviors			●--●							
Scaffolding intervention				●						
Record behaviors				●--●						
Contingent responsivity intervention					●					
Record behaviors					●--●					
Transfer to new materials							●-----●			
Maintenance									●-----●	

Yet, at the same time, it was expected that instructional patterns (e.g., modeling or assisting) would differ with the cultural norms and individual styles of each mother and child.

Procedures

This study employed a multiple-baseline-different-behaviors design (Barlow & Hersen, 1984). Single-subject design is often used in situations where an intervention with large populations in single settings is difficult, or when the population is not homogeneous (Mudre & McCormick, 1989). Noting the variations in individual histories, personalities, and environmental conditions among teenage mothers, we believed that an analysis of the individual might reveal varying responses across subjects that might be overlooked in group designs.

In multiple-baseline-different-behaviors design, subjects are measured for certain behaviors over time to establish a baseline against which further changes can be evaluated (Axelrod, 1983; Baer, Wolf, & Risley, 1968). Once the baseline has been established, an intervention is applied to only one of the behaviors. Then if the behavior changes in the desired direction, the procedure is continued with the first behavior, but is also applied to the second behavior. The fact that each behavior improves when the procedure is applied provides an argument for believing that the intervention is responsible for changes in behavior. Thus, one of the advantages of the approach is that it allows for the simultaneous measurement of several concurrent behaviors.

In the present study, we measured mothers' interactional behaviors during four phases of the study: baseline, a three-part intervention period, a transfer period in which mothers were given a new set of materials in the form of a grocery store prop box with no additional

coaching, and a maintenance period, in which mothers were asked to continue playing with their children on their own. Table 3 details the time-sampling schedule and observations and recordings throughout the 12-week study.

Baseline measures. An informal 30-minute interview was scheduled with each mother in her home during the first week of the study. Designed to obtain general information, the interview consisted of asking mothers about their home life, their typical daily schedules, favorite activities with their child, and their educational aspirations. Then they were asked to fill in a brief questionnaire requesting information on their child's favorite activities; at the same time, each child was individually administered the Peabody Picture Vocabulary Test (PPVT-Revised, 1981, Form L). This test is designed to provide an estimate of the child's receptive vocabulary and intellectual development. Results of the test supported previous research on children of teenage mothers; test scores indicated that the children were slightly below average ($X = 37.67\%$, $SD 19.75$, range 11-60).

Following testing, each mother and child pair was given a post office prop box. First, the book and objects were displayed and described; then, mothers and children were invited to play with the prop box and the items for approximately 10 minutes. This play was audiotaped, and notes were taken of nonverbal gestures and communications. Over the next week, the mother-child pairs were asked to play with the materials as they might normally do for at least 10 minutes a day and to record these sessions on audiotape. Follow-up calls were made on a regular basis.

Intervention period. All phases of the intervention took place in the home of each mother and child. A similar procedure was followed for each of the three coach-

ing sessions. First, the mother was given feedback from the baseline data. In the case of labeling, for example, we described techniques and showed the mother some examples of her own uses of labeling from the baseline experiences. Second, we demonstrated ways to enhance these interactions. For example, using the book and literacy items, we demonstrated different labeling formats and gave suggestions for making connections between these experiences and the child's real world. Third, we asked each mother and child to practice these techniques while we informally observed and took notes. Finally, we ended each session by giving them additional feedback based on their practice, and by giving them praise and encouragement for their efforts.

We structured these coaching sessions as informal conversations. For example, after an initial greeting with the family, a typical labeling session might begin by our saying "Last week we noticed that Karen asked many questions, and kept pointing to pictures when you were reading to her. That's really important because Karen is trying to learn the names of common objects that are interesting to her. Do you find that she often does this when you're off together on some of your errands?" This would generally lead to a discussion linking word learning to events like eating at a fast food restaurant or grocery shopping. Sometimes we would share stories of our own children, noting how curious children are to learn the names of things. Then, we might add "Not only do children need to learn labels, but they also need to understand what these items may be used for. We noticed that you did a great job telling her the names of items when we listened to the tapes. The next time, however, you might want to tell her more about what these items may be used for, in ways that might extend her understanding of the word. It's really helpful for children to learn about the functions of words and objects. It gives them a sense of power and more control of their environment." Then, to model the activity, we might pick up a piece of stationery and say "Hey Karen, let's write a letter together. We need a piece of stationery, and an envelope so that we can mail our letter to a favorite friend. On the envelope, it's important to write the person's name and address so the letter gets to him or her. Want to try to write a letter with me? Who should we write to?" After a few minutes of play, we would step back and encourage the mother and child to play together. Finally, we would end the session by reflecting together on the play activities. "It was really interesting to see how Karen picked up some of the words we were using. But did you notice how she used the general word *mail* instead of words like *letter* and *stamp*. As you play together this week, you might try using these words in the context of play. Have you noticed how much she

enjoys the time together? Has she wanted to do any writing on her own?" Again, this would encourage the mother to discuss ways in which these playful opportunities might link to other daily activities like receiving letters in the mail and writing birthday cards together.

In this manner, we attempted (a) to provide information to mothers regarding the importance of a particular behavior in the child's development (in this case, labeling), (b) highlight some of the activities that seemed to be especially effective, suggesting ways in which these behaviors could be extended and enriched, and (c) connect with other events in their ongoing interactions. Thus we attempted to accentuate the positive characteristics of the interaction rather than focus on the specific weaknesses in the mother's performance.

Subsequent coaching sessions followed a similar procedure for scaffolding and contingent responsivity. For example, in scaffolding we would (a) note positive instances of recruiting children's interest in reading and play, modeling and augmenting the mother's efforts from previous sessions, (b) emphasize ways in which these activities could be enhanced and linked to their daily lives, and (c) focus on specific activities for the coming week. In our final session, contingent responsivity, we described the importance of conversations with young children. Here, we would often suggest to mothers that they wait a bit before initiating an activity, respond to children's queries and topics, and add, if they could, to these creative scenarios. The three sessions, therefore, conformed to a similar overall structure, with a particular strategy focus (labeling, scaffolding, contingent responsivity) for each session.

Each session lasted approximately an hour. Part 1 focused on the mother's labeling of items, words, and pictures that were of interest to the child. After a 1-week period during which mothers were encouraged to practice and record sessions, we returned to audiotape and observed the play session. Transcripts of the tapes and analysis for five sessions in the three target behaviors—labeling, scaffolding, and contingent responsivity—were compared to baseline. These procedures were again followed for Part 2 of the intervention; here we coached mothers in scaffolding techniques, and recorded all interactions for five sessions. Finally, in Part 3, we focused on contingent responsivity for five sessions. Altogether, 15 sessions of interactional behavior during the intervention were recorded and analyzed for each mother-child dyad.

Transfer to new materials. Following the last phase of the intervention, we returned 1 week later to introduce new materials in the form of a grocery store literacy-related prop box. Our purpose was to determine whether the enhanced mother-child interactions might continue with a set of different materials and no additional inter-

Table 4 Definitions of labeling, scaffolding, and contingent responsivity

Labeling	
1.	This is an X. [a single word]
2.	What (who) is this? [counted only if the mother confirmed the label]
3.	Where is X? [again, with confirmation]
4.	Mother describes how a literacy item is used.
5.	Mother describes how a word, phrase, or literacy item relates to the child's real world.
Scaffolding	
1.	Recruits the child's interest
2.	Models or demonstrates an idealized version of the act to be performed
3.	Augments the child's efforts by breaking down a goal into a series of tasks, or takes over one of the tasks to enable the child to accomplish a goal
Contingent responsivity	
1.	Provides a semantic extension, adding new information to the content of the child's previous utterance
2.	Asks a clarifying question, encouraging child to interpret his or her previous utterance
3.	Answers the child's questions

vention. Over a 2-week period, 10 sessions were recorded and analyzed for all three target behaviors.

Maintenance. To examine behaviors once the novelty of new materials had worn off, we once again returned to each home to record mother-child interactions after a 2-week period. These 10 sessions constituted the final data collection phase of the study. A total of 45 sessions in all phases of the study were recorded for each mother-child dyad.

At the end of the last session, the Peabody Picture Vocabulary Test (Form M) was administered individually to each child.

Data analysis

An interval-recording technique was used to measure frequencies of three types of mothers' interactions: labeling, scaffolding, and contingent responsivity. Taped sessions were segmented into 2-minute intervals. A random interval was selected from either the beginning, middle, or end of the session and then transcribed verbatim. These data represented 45 two-minute intervals for each dyad.

Mothers' utterances were categorized by turns, defined as vocalizations or gestures considered to belong to the same topic (Ninio & Bruner, 1978). To refine our definitions of the three characteristics of mothers' interaction, we randomly selected several transcripts from baseline observations and together coded the utterances. These discussions led to working definitions of labeling, scaffolding, and contingent responsivi-

ty appropriate to our study. Utterances including control talk, self-repetitions, and asides were not coded or included in the analysis. Table 4 provides the definition of each behavior.

Next, to provide a measure of interrater reliability, we each took a sample of 10 randomly selected transcripts and coded them independently. Percentage of agreement for labeling was .94, scaffolding .90, and contingent responsivity .95. Once agreement was established, the transcripts were coded by one of the investigators.

Percentages were established for the defined behaviors by determining the frequency of each behavior over the total number of turns taken by the mother in the 2-minute interval at each point across the different phases of the study. Percentages of each behavior were then graphed for analysis.

In addition, the conversational turns of each child were examined to analyze whether modifications in mothers' mediational exchanges brought about greater participation in literacy-related activity from children. Here, we defined greater participation as active turn-taking or initiating literacy activity on the part of the child. Three categories of child utterances were coded: (a) active turns, which included the child taking over one or more elements of the literacy activity, such as labeling, directing, and extending literacy-related play, (b) responsive turns, which included verbal or gestural contact that responded to a mother's literacy-related utterance, and (c) unresponsive turns, which included independent actions or language that seemed to disregard or ignore the mother's previous utterance.

Each child's turns were examined at four points: baseline, following intervention, transfer, and maintenance. We followed a procedure similar to that used in the previous analysis. First, we examined a sample of transcripts to confirm our definitions of the three categories; then we established interrater reliability by independently coding 10 transcripts. Percentage of agreement was .95, .98, and 1.00, respectively, across the three categories. Using a random sample of intervals from the intervention period, we recorded 10 intervals in each category at each phase of the study. Repetitions and general asides related to other activities were not coded. In this analysis we examined group means, along with *t* tests, to analyze changes in children's responses across all conditions. Because the sample was small, *t* tests for correlated means were computed to serve as a priori comparisons in place of a repeated measures analysis that would not directly have tested the hypothesis of interest.

Further, to analyze the nature of children's initiatives, each active turn was examined for literacy activity.

Through repeated readings and discussion, eight categories were identified: labeling, pretending to read, engaging in a literacy routine (e.g., mailing a letter), writing, asking for clarification, adding new information, giving a literacy assignment, and requesting mother to read. A segment of a coded transcript is shown in Table 5.

Finally, a *t* test for correlated means was used to determine differences in pre- and posttest scores on the Peabody Picture Vocabulary Test for each child.

Results

Mothers' interactional behaviors

In this first analysis, we will present the results of the intervention on mothers' interactional behaviors in narrative form, briefly describing for each of the six mothers and children (a) a profile of the home setting, living arrangements, and the course of the intervention, and (b) an analysis of changes in interactional behaviors as a result of the intervention.

Sarah and Karen

Profile. Sarah was 21 years old and unmarried at the time of the investigation. She and her daughter, Karen, lived with her mother and her sister in a small, single home. All three women worked together in a family-owned dance studio where Sarah served as a part-time secretary. Karen spent every other weekend with her father, and the family received some support from him.

Sarah's fiancé was now living with the family. There was a warm atmosphere in the home, with Sarah and the others appearing to enjoy Karen. There were, however, only a few toys and a number of ragged children's books in the home. Although Karen attended preschool 2 mornings a week during the last month of the intervention, most of her time was spent with adults.

Sarah's interactions with Karen, before and after intervention, were characterized by playfulness. Sarah had a warm sense of humor and encouraged this sense in her daughter. Particularly in the beginning of the study, Sarah tended to be quite directive in play, often controlling the dialogue and play topic. As the study progressed, however, she seemed to become more responsive to Karen's literacy initiatives, guiding rather than overtly directing the play flow.

Analysis. As shown in Figure 1, Sarah's labeling cues increased dramatically after the first coaching session, from an average of 18% to 39%, while those for scaffolding and contingent responsivity remained low prior to any intervention. Following our focus in the second session on scaffolding, these percentages rose con-

Table 5 Segment of a coded transcript analyzing a mother's interactions and a child's participation

Speaker	Utterance and action	Type of response or utterance
Mother:	Okay, do you wanna be the postman first, or should I be?	[scaff]
Child:	You.	[resp]
Mother:	Okay, why don't you start makin' a card. Who do you want to make a card for?	[scaff]
Child:	Okay, I'll make a card.	[resp]
Mother:	I'm setting up the post office [moves the phone, stamp pad, mailbag, and "open" sign near the steps; puts on the blue shirt].	[scaff]
Child:	[walks over to the "post office"] I need one of these things [picks up a label]. I'm writin' to Daddy.	[act]
Mother:	What are you gonna write to him?	[con. resp]
Child:	Makin' card.	[resp]
Mother:	A letter?	[label]

Key: act = active
 con. resp = contingent responsivity
 label = labeling
 resp = responsive
 scaff = scaffolding

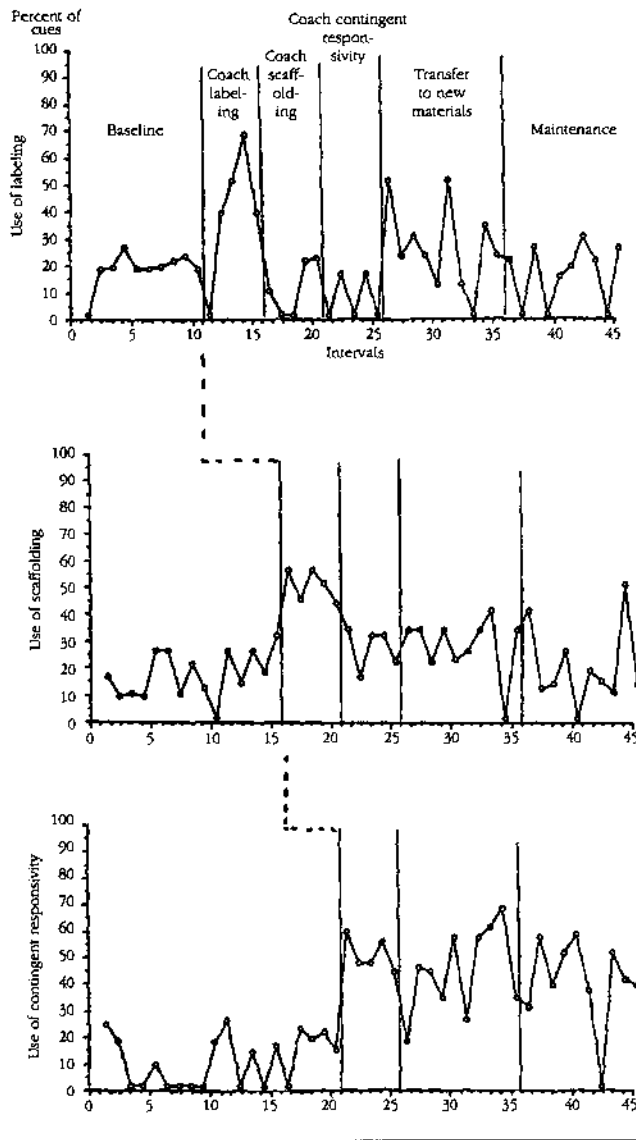
siderably (21% to 49%), with no evidence of change in the untargeted behavior of contingent responsivity. Similar data are shown for contingent responsivity; percentages remained low prior to intervention (7%), but increased substantially after coaching (49%). Scores in labeling and scaffolding, in particular, declined during transfer and maintenance; however, contingent responses appeared relatively stable, with average scores at 36%. Thus, of the three behaviors demonstrating change during the intervention, only the number of contingent responses showed evidence of more stable duration.

Brenda and Alison

Profile. Brenda was 19 at the beginning of the study. She and her 3-year-old daughter lived with her parents, her brother and his wife, and their newborn baby. Their single home was small, crowded, and cluttered. Brenda worked full time at a beauty shop, and Alison was cared for by other members of the family. Alison occasionally saw her father, and the family received some financial support from him.

There was considerable turmoil in the home. At one point during the study, Brenda and Alison had to move out of the house because of a physical fight with her sister-in-law. Few play materials, books, or magazines were available in the home. While Alison appeared to be well cared for physically, Brenda did not seem to have a very warm or positive parenting style.

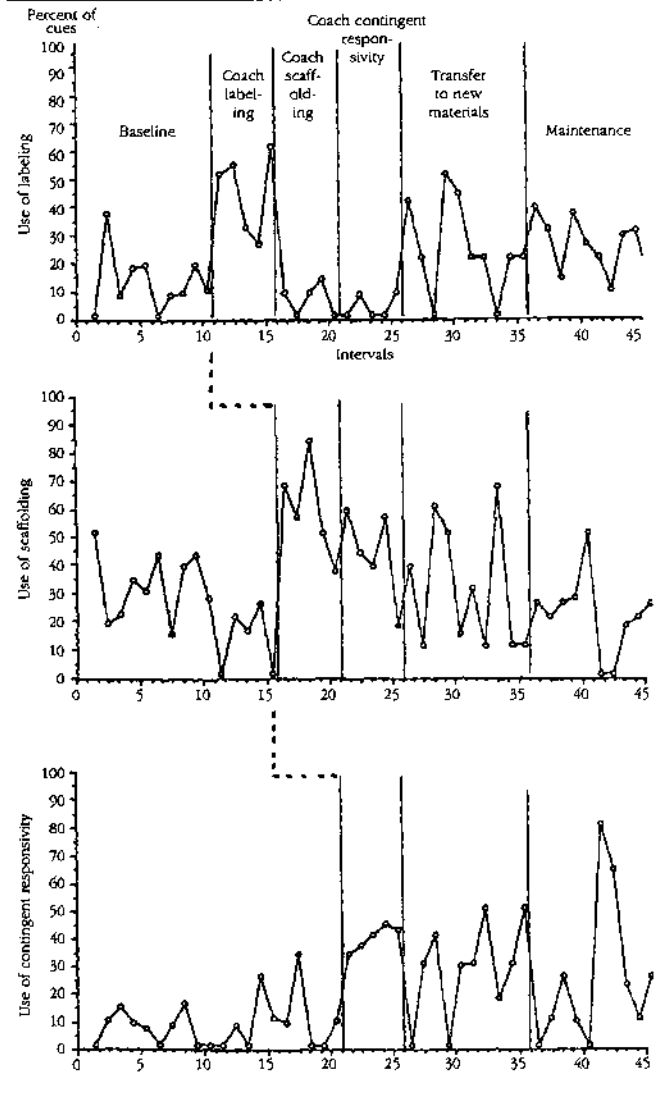
Figure 1 Sarah: Percentage of cues for labeling, scaffolding, and contingent responsivity



Very directive with Alison in the beginning of the study, Brenda concentrated on letter names, sounds, and colors. She offered little assistance in play; interactions with Alison were often in the form of verbal commands. With coaching, Brenda became somewhat less didactic in her communicative style. As the study progressed, she provided some degree of assistance in literacy routines and became more responsive to Alison's participation. Beset with family problems, however, Brenda often had difficulty concentrating on activities with Alison, frequently being interrupted by others in the household.

Analysis. As shown in Figure 2, Brenda's labeling scores increased as a result of the intervention (12% to 44%). This pattern was also reflected in the second and third phases of the intervention, as noted in changes from baseline in both scaffolding (26% to 58%) and contingent responsivity (8% to 39%). Though remaining higher than baseline, scores declined for each behavior during the transfer to new materials (23%, 30%, 28%, respectively). Even through maintenance, however, cues

Figure 2 Brenda: Percentage of cues for labeling, scaffolding, and contingent responsivity



for labeling (24%) and contingent responsivity (25%) were used at least twice as often as prior to the intervention, indicating marked changes from the baseline period as a result of coaching.

Kathy and Amy

Profile. Kathy was 19 years old at the beginning of the study and her child, Amy, almost 4 years old. Kathy lived in a townhouse with her mother and two brothers. She spent little time with Amy, with her mother assuming most child-care responsibilities. In addition to working at a part-time job, Kathy was enrolled as a full-time nursing student at a community college. She received no financial support from Amy's father, and they had no contact with him. There were few toys and children's books in the home.

Kathy tended to be very goal oriented, which was reflected in the early book-reading and play sessions with her daughter. Her efforts to direct and control the literacy events were, at times, in conflict with Amy's own ideas. Sometimes Kathy seemed so goal oriented that she missed the richness of her daughter's imagination. However, as the sessions continued, Kathy became less controlling as she responded with humor and enjoyment to Amy's contributions to the literacy play activities.

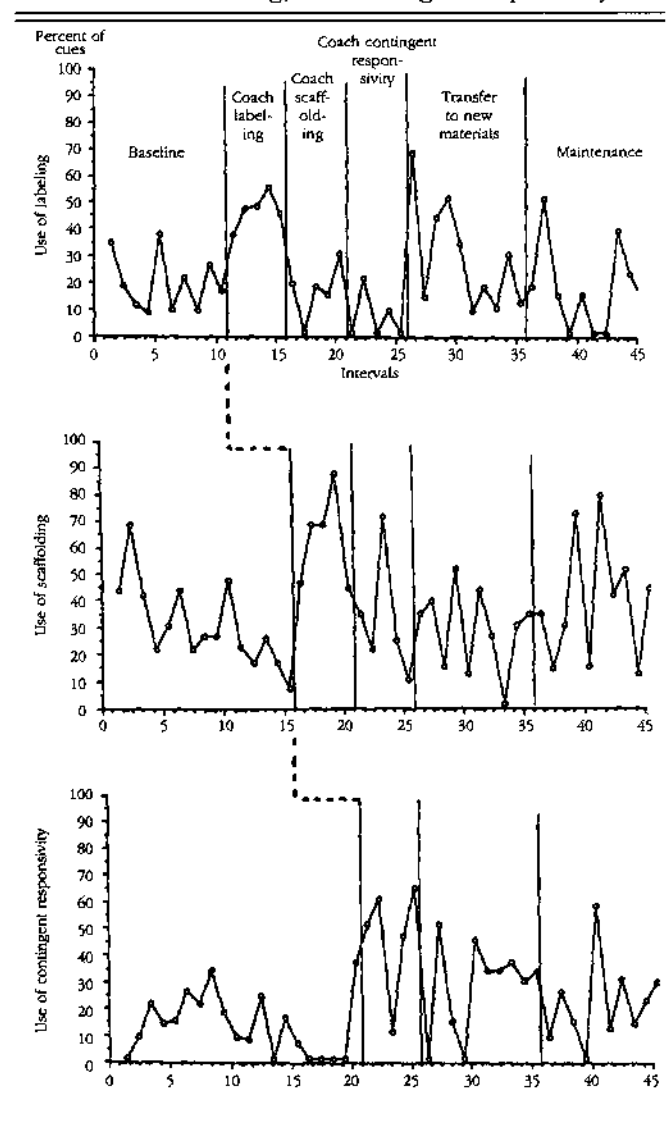
Analysis. Figure 3 indicates that from baseline, Kathy's cues for labeling increased substantially following intervention (18% to 45%). Cues for scaffolding and contingent responsivity also rose during the weeks after intervention (29% to 32%; 13% to 46%). Scores declined for all three interactional behaviors, however, following the transfer to new materials (28%, 36%, 27%, respectively), with further declines during maintenance. Average scores from baseline to maintenance for labeling (18% to 17%), scaffolding (29% to 38%), and contingent responsivity (13% to 21%) suggested that in Kathy's case, the intervention had only a modest influence on interactional behavior.

Rhonda and Tim

Profile. Rhonda and her son Timmy, who was 3½, lived with Rhonda's mother (who was alcoholic), grandfather, and brother in a small, cluttered home. Having an alcohol problem herself, Rhonda was frequently asleep when the researcher arrived. Her son, Timmy, was often sick with a cold or cough. Loud arguments occurred in the home frequently. Tim had little contact with his father, and they received no financial support from him.

For a time during the study, Rhonda worked in the kitchen at a residential school for the retarded. She was fired from this job because of frequent absences. She was arrested twice: once for driving without a license,

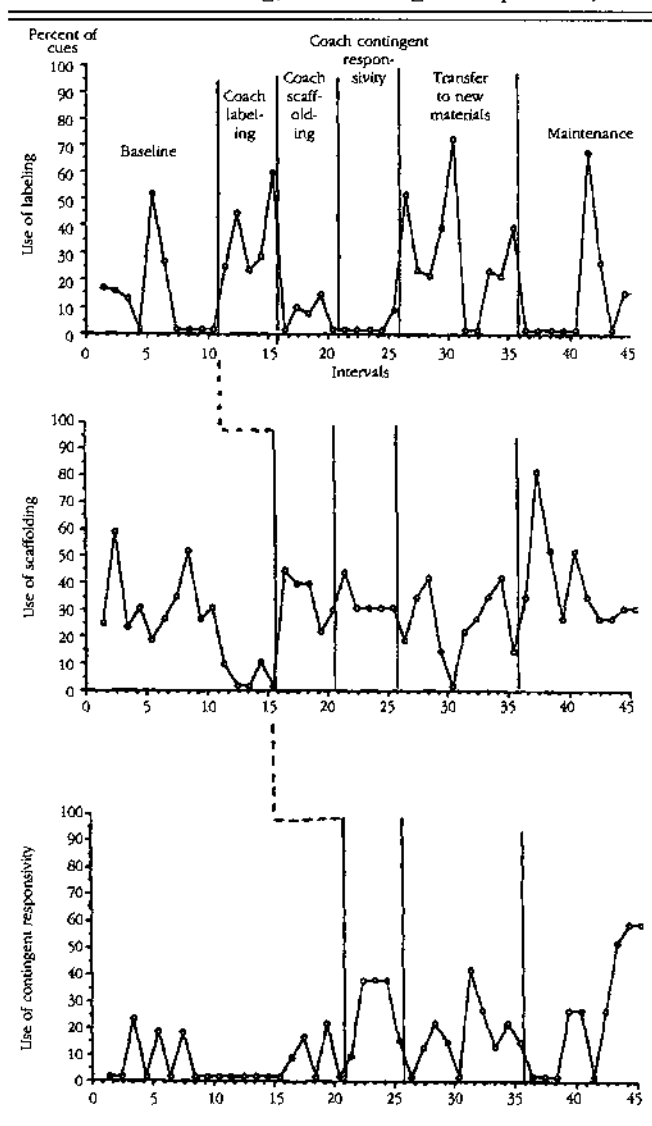
Figure 3 Kathy: Percentage of cues for labeling, scaffolding, and contingent responsivity



and once for assaulting an officer. After the second arrest, Rhonda began to see a counselor and made plans to acquire her General Equivalency Diploma (GED). She was told that she could lose custody of her son if she did not make significant changes in her lifestyle.

Despite all the turmoil in her life, Rhonda was affectionate with Timmy and seemed to enjoy interacting with him. He participated eagerly in the literacy play activities. And even when feeling poorly, Rhonda usually attempted to engage her son's attention, trying to make the literacy play times a positive experience.

Figure 4 Rhonda: Percentage of cues for labeling, scaffolding, and contingent responsivity



Analysis. As Figure 4 shows, Rhonda's cues for labeling increased substantially from the baseline average of 12% to 35% following intervention. Changes in scores for scaffolding were more modest, from an average of 22% during baseline to 33% after intervention. Cues to enhance contingent responsivity showed the most dramatic gains, averaging only 5% at baseline and increasing to 26% after coaching. Following the last coaching session, however, Rhonda's difficulties with the law increased, making it impossible for her to continue on the same schedule as others in the study. Thus, the transfer and maintenance periods were extended 2 weeks beyond that of the other subjects; as Figure 4

shows, all three interactional behaviors decreased considerably during this time (28%, 23%, and 15%, respectively). Even with the substantial drop, scaffolding behaviors (21% to 35%) and contingent responsivity (5% to 18%) remained above baseline levels, suggesting modest effects of coaching on interactional behaviors.

Harriet and Bobby

Profile. Harriet was almost 22 at the beginning of the study and was married to Bobby's father. They lived in a comfortable, well-cared-for row home in an urban area. Bobby had a number of toys and approximately a dozen children's books. Harriet's husband had a full-time job, and Harriet stayed at home, where she cared for Bobby and his infant brother.

Although Harriet appeared to manage the house well, she seemed, at times, to be overwhelmed by the demands of parenting. Bobby appeared to do whatever he wanted, including wearing shorts in the middle of winter or eating lollipops in the morning. It seemed that Harriet felt she had no control over these events.

At first, Harriet and Bobby appeared rather shy with one another. Book reading and play showed little imagination. Over time, however, Harriet began to become an active participant as she encouraged Bobby to use his creativity. She often did this by adding some of Bobby's own toys to the play setting. Both seemed to enjoy their literacy play activities together.

Analysis. As Figure 5 shows, all three of Harriet's interactional behaviors changed positively after the intervention. Following coaching, the average number of cues more than doubled in labeling (22% to 57%) and more than tripled in scaffolding (18% to 64%) and contingent responsivity (10% to 32%). While scores in labeling dropped considerably during the transfer phase (26%), gains were still relatively high for scaffolding (45%) and contingent responsivity (24%). Though cues for labeling continued to decline through maintenance (22%) to their original level, those for scaffolding (37%) and contingent responsivity behaviors (27%) remained substantially above baseline, indicating that they were influenced by the intervention.

Donna and Todd

Profile. Donna was 20 years old and her son, Todd, almost 4 years old at the beginning of the study. Donna was married just before the study began to someone other than Todd's father. They lived in a single home with her parents and her brother.

Donna had a full-time job as a computer entry operator. She worked several long periods of overtime during the study. Todd went to a babysitter when she was at work. Donna voiced strong opinions against early

schooling, preferring to teach Todd herself. Using laborious drill-like methods, she concentrated on the recognition of alphabet letters, colors, and shapes. She seemed embarrassed that Todd lacked these skills, and was often frustrated with his inattentiveness. She also appeared to be overwhelmed at times and gave in easily to his demands.

Of all the mothers in the study, Donna seemed most receptive to suggestions about book reading and play. In the beginning she had a tendency to dominate the play interactions, often attempting to turn the play into a literacy lesson. Todd usually demonstrated a good deal of resistance to this type of interaction. With coach-

Figure 5 Harriet: Percentage of cues for labeling, scaffolding, and contingent responsivity

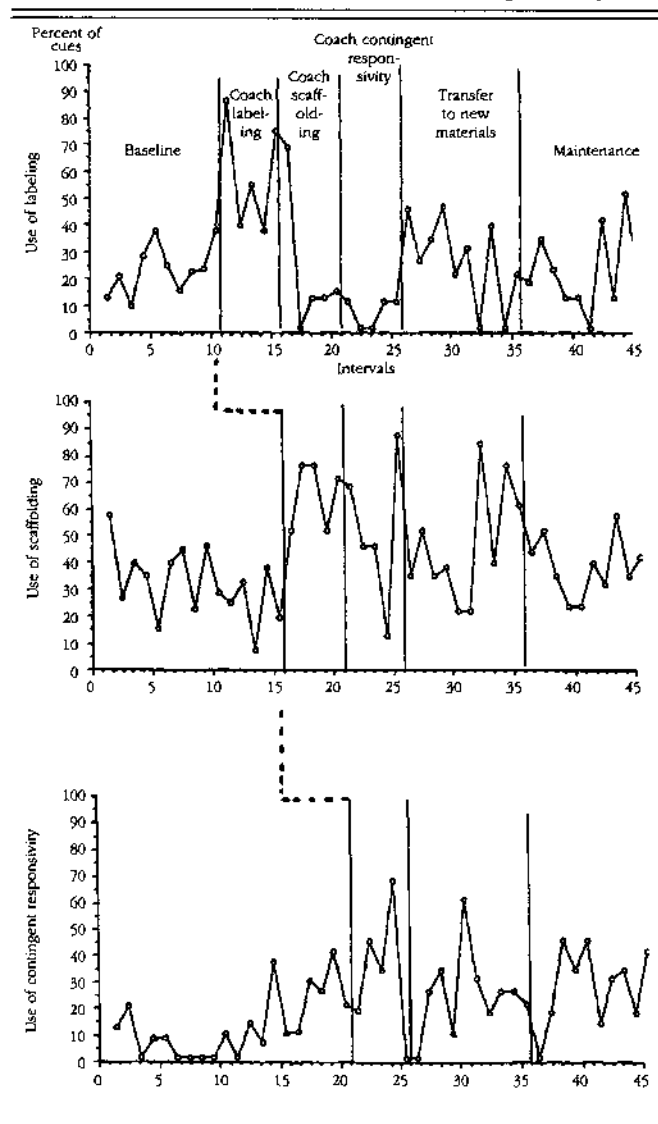
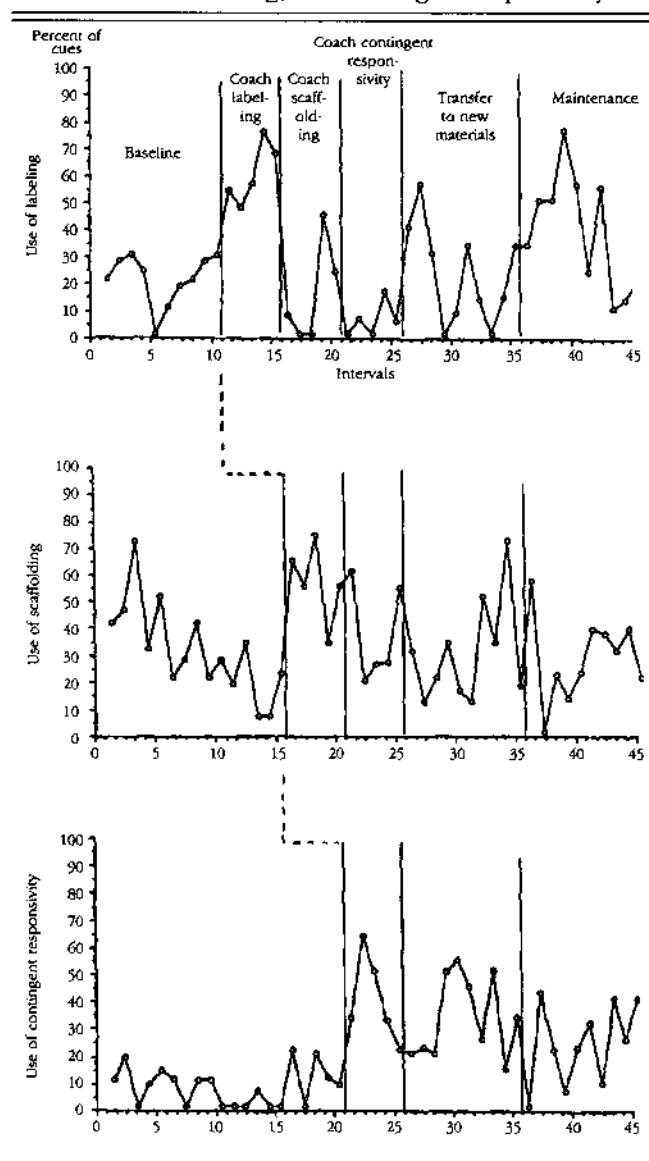


Figure 6 Donna: Percentage of cues for labeling, scaffolding, and contingent responsivity



ing, however, Donna began to spend less time on skills and became more willing to take on roles that involved literacy routines. While still tending to organize the play, she seemed more responsive to Todd's play initiatives.

Analysis. As shown in Figure 6, Donna's cues for labeling increased substantially following intervention (20% to 60%), with more modest increases found for scaffolding cues (44% to 53%). The most dramatic change was in the number of cues for contingent responsivity. Prior to coaching, Donna rarely responded to Todd's language initiatives, as evidenced by the low baseline scores (8%). Following intervention, however,

Table 6 Average number of turns taken by children across the four phases

Type of turn and phase of the study	Mean number of turns taken	SD	Range
Active			
Baseline	15.17	9.77	3-30
Intervention	29.50	6.65	19-36
Transfer	21.30	10.69	5-36
Maintenance	26.67	14.10	3-46
Responsive			
Baseline	44.50	18.79	17-65
Intervention	57.17	7.08	46-64
Transfer	23.33	10.21	10-35
Maintenance	31.17	13.41	15-48
Unresponsive			
Baseline	17.33	5.31	9-24
Intervention	8.33	4.89	4-17
Transfer	2.50	1.76	0-5
Maintenance	3.16	1.69	2-4

cues for contingent responsivity rose to 40%. From their high point after intervention, all three scores declined during transfer (23%, 29%, 33%) and maintenance (39%, 27%, 24%). Still, cues for contingent responsivity remained over three times more frequent (8% to 24%) throughout the study period.

In summary, a visual analysis of the graphed data for all six mother-child dyads clearly revealed changes in the frequency of cues from baseline to intervention. Though the changes differed in magnitude, the intervention produced distinct increases in mothers' uses of labeling, scaffolding, and contingent responsivity. While scores declined with the transfer to new materials and maintenance, in almost all cases, mothers continued to use these strategies to a greater extent than in baseline. Of the three interactional behaviors, cues for contingent responsivity seemed to remain more sustained throughout the study period, indicating mothers' increasing responsivity to their children's literacy initiatives.

Children's responses

In the next phase of the analysis, we examined how the children responded to their mothers' interactions. Here, we looked at the average number and type of children's interactions as a group ($N = 6$) across all four phases of the study. Results are shown in Table 6.

Scores revealed that children took relatively few active turns during the baseline period, with an average of slightly over 15 turns per interval. Instead of initiating, children tended to respond to their mother's utterances, as in the following example:

[Mother and child are playing post office.]

Mother: Well, this is the post office right here. That's your telephone—in case the phone rings, you answer it, okay?

Child: Okay.

Mother: Want to answer it—is the phone ringing?

Child: I don't think so.

Mother: Did you stamp the letter yet?

Child: No, now should I stamp it?

In these types of interactions, children seemed to take their cues from their mothers, jointly interacting in a play situation created by the mothers. Here, the child's role appeared to be that of an apprentice, as the mother seemed to consciously externalize the various steps in a literacy routine. This type of play was highly adult directed, generally characterized by longer dialogue sequences from the mother, and brief exchanges from the child. Noteworthy as well during baseline was the average number of unresponsive turns. Mothers' entreaties to play often brought on negative reactions from the children in the form of refusals or humorous responses, as shown in the following case:

Mother: You wanna play mailman?

Child: No.

Mother: And we can write a pretty card.

Child: No way.

Mother: How about putting on the mailman's shirt?

Child: Nope.

Mother: Where should we put the phone?

Child: You take it out, you put on my head.

Mother: Ding, ding. It's ringing. Answer it.

Child: Nuh, uh. You're just lying.

Recorded with greater frequency than active turns, unresponsive turns seemed to indicate subtle breakdowns in communication, with the child expressing a lack of interest in engaging in literacy play.

Following the intervention, however, the average number of active and unresponsive turns began to change, with the average number of children's active turns increasing, and the average number of their unresponsive turns decreasing. Unlike responsive turns, these active turns seemed to place the mother in the role of supporter, as children initiated and directed their own activities in play, as in the following example:

[Mother and child have just read *Tommy at the Grocery Store*.]

Child: Mommy, I want to do it like Tommy. I wanna play what we just read! Please!

Mother: I guess.

Child: And you be mommy. You be mommy.

Mother: All right.

Child: Here Mom. Here's your money, Mom.

Mother: Okay.

Table 7 Average number of active turns for each type of literacy activity across the four phases of the study

Literacy activity	Phase of the study			
	Baseline	Intervention	Transfer	Maintenance
Labeling	4.50	4.50	8.50	9.30
Pretending to read	.44	3.20	2.00	1.00
Engaging in literacy routine	2.70	8.50	3.50	5.50
Writing	.83	3.73	2.50	1.90
Asking for clarification	1.50	2.00	1.94	3.50
Adding new information	1.37	2.75	2.20	3.00
Giving literacy assignment	2.00	3.32	.66	2.30
Requesting mother to read	1.83	1.50	0	.17
Total	15.17	29.50	21.30	26.67

Child: Mommy, buy stuff! You could, you could get one magazine.

Mother: Umm, I'll take sports.

Child: This one? [She then pretends to scan it by the cash register.]

As scores indicated in Table 6, children's active responses increased during the intervention, then declined with the transfer to new materials. Even with fewer active turns, however, the average number of unresponsive turns continued to decline, suggesting greater responsiveness to literacy play. Children's initiatives again increased during the maintenance period.

Examination of *t*-test scores indicated that the number of children's active turns from baseline to maintenance was statistically significant [$t(5) = 2.71, p < .05$], revealing children's increasing involvement in initiating and managing the literacy play activity. At the same time, there was a significant decline reported for unresponsive turns [$t(5) = 7.79, p < .001$], suggesting a greater mutual understanding between mothers and children. In both cases, significant differences were revealed from baseline to intervention scores for active turns [$t(5) = 3.02, p < .05$], and for unresponsive turns [$t(5) = 4.88, p < .01$]. Average number of responsive turns from baseline to maintenance, as well, significantly declined [$t(5) = 2.61, p < .05$].

Examining the nature of these active turns, we found that with the exception of requesting mothers to read, children initiated more literacy activities than at baseline (see Table 7). As revealed in these average scores following intervention, children's labeling of literacy objects increased throughout the study. Further, the children became more active in pretending to read, engaging in literacy routines, writing, and giving (rather than taking) literacy assignments. In fact, children's active pretending to read might account for decreases in requesting mothers to read to them. Even through transfer and maintenance, more active participation was

reported in six out of the eight literacy activities. These findings suggest that children engaged in a wide variety of literacy tasks, involving their mothers in literacy-related activity of the child's own choice.

While these data must be interpreted cautiously due to competing hypotheses such as history, they do suggest that children's participation in initiating literacy-related play significantly increased over the course of the study. In keeping with Bruner's (1984) motto "where before there was a spectator, let there now be a participant," these supported play situations seemed to allow for dynamic shifts in participation, allowing children to take on increasing responsibility for engaging in literacy activity.

Children's receptive vocabulary and intellectual development

Table 8 represents the results of the differences in pre- and posttest scores for the Peabody Picture Vocabulary Test. Mean percentile score differences were statistically significant from the pretest to the posttest [$t(5) = 4.58, p < .01$], reflecting change from slightly below average (37%) to slightly above average (74%) scores. Though measuring only one important facet of intellectual development, chiefly receptive vocabulary, these data reveal significant gains in children's growth over the course of the 3-month study period.

Table 8 Pre- and posttest mean percentile scores, standard deviations, and ranges on the Peabody Picture Vocabulary Test

Variable	<i>N</i>	Mean	<i>SD</i>	Range
Pretest	6	37.67	19.75	11–60
Posttest	6	74.17*	14.36	60–94

* $p < .01$

Conclusions and discussion

Children are drawn to the uses of written language through participation in social activities that require its cognitive and communicative functions (Harste, Burke, & Woodward, 1982; Hiebert, 1978; Neuman & Roskos, 1993a; Tharp & Gallimore, 1988). In this context of day-to-day engagement, parents appear to tacitly guide their eager participants in print-related activities, assisting and structuring the children's attempts through verbal and nonverbal communication. It is through this shared understanding between parent and child that children's learning is thought to be extended to new print opportunities and activities.

Consequently, our focus in this study was to enhance the caregiving environment using developmentally appropriate materials for early literacy learners in culturally familiar social contexts (mailing letters and grocery shopping) and to help teenage mothers build on the knowledge and skills that children might have already developed. Using the metaphor of coaching, we suggested that mothers use different formats to label, scaffold, and respond contingently within collaborative play explorations as a means of extending their children's active participation in literacy activities and cognitive growth.

Results of our study indicated changes in the frequency of labeling, scaffolding, and contingent utterances from mothers following the intervention. Across all tiers, after coaching and practice, each of the six mothers engaged in greater uses of these cues than during baseline. Fewer instances of "talking to" the child were recorded than talking responsively "with" the child. At the same time, children became more active in literacy-related play. They wrote letters, read labels, cut out coupons, and asked questions, creating many playful scenarios in which literacy was an integral part. Responding with more semantically contingent speech, mothers seemed to build on these utterances, connecting print activities to their shared daily lives. Supporting the "voluntary hand-over and willing receipt" principle (Bruner, 1975), these results suggest a process similar to one that occurs in storybook reading (Ninio & Bruner, 1978; Snow & Goldfield, 1982). Increasingly active participation on the part of the child seemed to send the mother a signal that the child was now capable of a literacy routine. Thus, as Wertsch (1984) has suggested, through mothers' use of more appropriate forms of mediation in communication, and through children's responding in more active ways, intersubjectivity was created through language.

Fine-tuning parental assistance may have broad consequences for children's literacy progress and cogni-

tive growth. Wood and his colleagues, in a series of studies (Wood, Bruner, & Ross, 1976; Wood & Middleton, 1975; Wood, Wood, & Middleton, 1978), found that parents who structured their assistance according to their child's needs were more likely to increase their child's cognitive competence than were parents who did not show such sensitivity. Schachter (1979), as well, in her comprehensive study of maternal speech, reported that the major difference between disadvantaged and advantaged mothers clustered around a factor of responsivity. It was not the form, dialect, or frequency of the mothers' speech, but rather the mothers' ability to be responsive to the child's communication that appeared to enhance the level of cognitive activity. In this study, as well, a similar pattern was reported: increased responsivity from mothers was associated with increased initiative in literacy and cognitive growth on the part of the children.

Linkages among these factors raise two interesting questions: (a) Is there sufficient evidence to claim a causal connection between the quality of mother-child interactions and children's emergent literacy and intellectual performance? (b) Whether there is or not, should one intervene to help low-income mothers structure activities that may potentially serve an important role in literacy learning?

The answer to the first question is clearly no. This study, as well as others (Farran, 1982; Schachter, 1979; Wells, 1985), cannot generate causal statements. The profiles of the families described here, for example, suggest that even with traditional experimental studies using control groups, it would be impossible to control adequately for environmental factors that surely affect literacy involvement and cognitive growth. However, we believe that the answer to the second question, in view of the importance of early intervention in language and literacy, is yes. In surveying the literature on maternal instruction, one is beset with labels indicating differences between "middle-class" language and "working-class" or "lower-class" language (Bernstein, 1970; Hess & Shipman, 1965). Moreno, in a recent review (1991), has argued that these studies are laden with social and ethnocentric value judgments. Far worse, in our view, is that they approach parent-child communication patterns as if they were static characteristics, rather than alterable variables (Bloom, 1981). In this study, for example, teenage mothers' lack of involvement in literacy-related activities did not appear to result from a lack of caring or from "low status" but from a lack of knowledge that certain activities and behaviors may serve as important precursors to literacy learning and cognitive growth. What these women needed, then, was education. Once engaged, mothers and children together were able to

create a zone of proximal development (Vygotsky, 1978), resulting in dramatic gains in children's active participation and intellectual development.

In support of a single-case approach, however, evidence on the basis of the graphed data for individual mothers strongly indicates that there were wide variations in the magnitude of change. For example, visual analyses of Harriet's and Kathy's interactions showed greater responsivity to the intervention than was seen in Rhonda's case, probably because of the degree of turmoil in Rhonda's life. Even so, if asked the traditional question in single-subject experimental research: Are the changes great enough to be of functional value? (McCormick, 1990), we would argue that the modifications in mothers' mediational behaviors, though modest at times, were great enough to effect meaningful change. That these results were replicated across six dyads gives evidence, further, to suggest a degree of generality (Barlow & Hersen, 1984).

Consequently, we suggest that a coaching approach to intervention (much like Lamaze or La Leche League coaching for pregnancy or breastfeeding) may serve as an effective technique for helping mothers enhance the early literacy experiences of young children. This intervention approach did not formally train mothers to teach literacy or vocabulary to 3- and 4-year-old children; rather, we provided playful opportunities for mothers and children to engage in behaviors that used language and literacy for functional purposes, and gave them strategies through ongoing conversations to enhance joint participation. The literacy play materials (which included books as well as literacy objects) allowed children to act as if they were accomplished readers and writers, encouraging a broad range of literacy behaviors. Further, they provided a context for mothers to share past and future events, linking children's lives to activities that are common to the larger, literate society.

That the frequency of mediational cues declined in the later phases of the study, however, indicates the unique contribution of coaching to guiding mothers' participation. It also suggests that longer interventions are probably necessary in order for these mediational strategies to become part of the mothers' response repertoires. This emphasizes the importance of maintaining a multifaceted approach to intervention: Materials and physical environmental changes are not sufficient to bring about changes in mother-child communicative patterns. While difficult, we believe that our home visits created a zone of proximal development between ourselves and the mothers in our study. These visitations were critical for sharing information and for establishing rapport, trust,

and ongoing dialogue with mothers as they ventured into new ways of engaging with their children.

There are, however, important limitations in this research. For one, the study focused on dyadic situations in a unique context, overlooking the complexity of the routine social situations that are part of children's print experiences in everyday life. In this respect, it did not examine how children's participation might relate to the more natural but more adult-dominated events that occur in day-to-day living. Further, no claim can be made for literacy growth; rather, active engagement in literacy and gains in receptive vocabulary served as proximal indicators of language and literacy in its emergent form. Nor can we assume that there might be continuing effects, beyond the transfer and maintenance periods, on the nature and quality of parent-child interactions over time. Finally, on the basis of the research, it cannot be assumed that any one factor, including labeling, scaffolding, or contingent responsivity, or any combination of these factors, was directly responsible for children's change scores in cognitive growth.

With recognition of these limitations, we can argue from our research that in contrast to the view that parent-child interactive teaching patterns are a static characteristic, these communicative processes are indeed alterable. Even in the most difficult of personal circumstances, mothers, caring deeply for their children, attempted to guide, support, and challenge them as they engaged in literacy activity. They helped to structure situations so that their children could creatively participate in print contexts. And it is through their guided efforts that these children will be apprenticed to literacy, becoming active and inquiring participants in the intellectual and social lives of their society.

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Received September 24, 1992

First revision received July 28, 1993

Second revision received February 18, 1994

Accepted March 1, 1994

AUTHOR NOTE

We sincerely appreciate the efforts of the mothers and children who, for reasons of confidentiality, must remain anonymous.