

Family and Child Factors Contributing to "Successful Storytime Interactions" with Children with Developmental Delays

Phyllis Schneider, University of Alberta, Edmonton, AB, Canada
Thomas S. Weisner and Ronald Gallimore, University of California, Los Angeles, CA, USA

Storytime interaction has been proposed as a promising context in which to enhance children's emergent literacy skills. It is insufficient, however, to focus research and intervention efforts on the parent-child interactions alone, since for interactions to occur at all, a supportive context has to be in place. Nor is it sufficient to use distal proxies of context, such as child developmental quotient or parental education, since they are not directly a part of the activity of book reading, nor do they indicate the mechanisms through which context influences storytime interactions. Context includes features closer to the storytime activity itself. In this paper, we show that two important context measures -- parental goals and the overall impact of the child on the family daily routine -- influence storytime interactions. Correlations were found between storytime interactions on one hand and goals and child impact on the other, whereas standardized developmental measures were unrelated to storytime reading interaction measures. Our interpretation of the results argues that each mother brought to the story task a prior schema about how her child would respond to such an activity, and used that schema, and the family goals for that child, in engaging in interactions with the child around the story. That prior schema in turn is shaped by the child's hassle level and the mother's prior experiences in everyday activities, before engaging in the storytime tasks, in accommodating her everyday activities to the child's developmental delay.

In this paper we examine interaction between mothers and children with developmental delay as they look at a storybook together, and look for relationships between their behaviour in this activity and other aspects of the family context, specifically, parental goals for child development and difficulties associated with the child's developmental delay that have an impact on family functioning. We will argue that it is necessary to look at the wider context of interaction in order to develop effective intervention programs for these families.

Families are often urged to use storybook reading time to promote cognitive and language development in their children (e.g., Smith & Durkin, 1986). These recommendations are based on studies of effects of adult-child interaction on cognitive and language development of children. For example, early experience of being read to by an adult is associated with a child's success in acquiring literacy skills (e.g., Arnold & Whitehurst, 1994; Heath, 1982; Moon & Wells, 1979; Whitehurst, Arnold, Epstein, Angell, Smith, & Fischel, 1994). Some researchers have found correlations between the amount of time spent reading and the development of specific literacy skills (Morrow, 1983) and overall literacy attainment in the first year of school (Wells, 1985). Also related to early attainment of such skills are the child's interest in and concentration during activities associated with literacy (Wells, 1985). Children appear to learn "emergent literacy skills" from these early experiences that prepare them for literacy instruction at school (van Kleeck, 1990).

A common interpretation of these findings is that more and better parent-child interaction around book reading will result in more and better literacy development in the child. It has in fact been documented that changing adult behaviours during literacy activities can have a significant effect on children's language abilities (Arnold & Whitehurst, 1994) and literacy skills (Box, Cowles, & Aldridge, 1991; Morrow, O'Connor, & Smith, 1990). Thus it is feasible that we could improve the reading abilities of children with developmental delays by encouraging their parents to read more frequently with them, as well as by fostering optimal ways of interacting around books.

Others have argued that intervention recommendations focused only on the details of adult-child interactions while reading, run a serious risk of neglecting the wider context of development. Storybook interactions themselves must be successfully embedded in the family's everyday activities, so that they occur as a part of the family's daily routine (Gallimore, Goldenberg, & Weisner, 1993), in order to have developmental significance or intervention value.

Interventions that are based only on detailed micro-analyses of interaction, but ignore prior parental experience with the child and the child's general attention levels or temperament, also run a great risk of missing a complete picture of the variables that affect development (Schneider & Gearhart, 1988). Family behaviours in interaction with the child with developmental delays, including adjustments that

adults make in response to the characteristics of the child, are part of the wider context of family accommodations to the child with developmental delays (Bernheimer, Gallimore, & Weisner, 1990; Gallimore et al., 1993). Accommodations are the active choices made by parents to reorganize the daily routine and activities in the routine, responding at least in part to their child with developmental delays. Decisions about work hours, transportation logistics, where to live, information gathering, social supports, and other features that define the tasks and organization of the daily routine, are shaped by accommodations (Bernheimer et al., 1990; Gallimore et al., 1993). For example, parents faced with a child with special needs may decide that one parent will give up a career to stay at home and care for the child, or they may decide to take a better but less rewarding job to provide extra funds for special programs or personnel. Many such accommodations will have impact on interaction with the child, such as who interacts with the child, in what contexts, and with what frequency.

In addition to more global accommodations, such as work and living choices, family members also need to make changes in their day-to-day interactions with the child with developmental delays. One of the factors to which parents must accommodate is what we have termed the hassle level (Gallimore, Weisner, Bernheimer, Guthrie, & Nihira, 1993), or the communicative, behavioural, medical or motor characteristics associated with the child's developmental delays that create problems for the family. Hassle level is associated with family accommodation to children with developmental delays (Gallimore et al., 1993). It is likely to affect everyday interaction as well. For example, in a family in which a child's behaviour during storybook reading time is highly disruptive, parents may be less concerned with what is said to or requested of the child (e.g., asking the child to label a picture) than with simply sustaining a brief interaction of any quality. With a child who is inattentive or disruptive, a parent might rush to get as much of a book read as possible before the child's attention is gone. Children who are more cooperative may be more responsive to parental requests, and offer parents more opportunity to make requests of them in the first place.

In addition to family accommodation and hassle level, the goals parents set for their children may have an impact on interactions during storytime activities, including whether such interactions occur, and how parents approach such interactions. Goals for development

organize parental responses to and understanding of an adult-child interaction, yet these goals are not overtly visible in the interaction itself. Parents who have the goal of actively attempting to stimulate their child's development, for instance, should be more active (e.g., talk more) when observed in interaction with their child. Parents who express the goal of "taking things day by day", rather than "pushing" the child as much as possible, should be responsive in different ways during reading interactions.

One approach to identifying variables that affect interaction has used relatively distal, "packaged" variables such as mother's education. Education, and the literacy skills that go with it, presumably are put to effective use in storytime interactions. The limitation of such variables is that they are indirect or proxy measures of proximal variables that more directly affect daily routine and the interaction opportunities it creates (White, 1982). Our stance, based on ecocultural models of family adaptation and human development, is that more proximal measures are required for understanding the ecocultural niche within which development occurs. Such measures will reveal more directly the mechanisms which create and sustain a child's everyday routine and cultural niche, and which have cultural meaning for the parent and child (Weisner & Gallimore, 1985; Super & Harkness, 1980, 1986; Weisner, 1984). Focus on proximal determinants of interaction (e.g., parental behaviours in storytime activities) rather than more distal proxies of these determinants (e.g., parental education levels) would be more useful for planning interventions. We cannot tell parents to go to school to accumulate additional years of education and thereby interact more effectively with their child, but we could suggest that they reshape their everyday routine of life, and perhaps reconsider their goals for their child in a way that is meaningful for them, and fits with the routine and goals they already know.

In this paper we directly examine two proximal variables, hassle level and parental goals for the child's development, and their relation to parent-child interaction in a storybook activity. Along with hassle level and goals, we also examine our data for effects of variables such as maternal education and the child's tested cognitive ability. We anticipated that the proximal measures would strongly relate to measures of storybook reading activity, whether or not maternal education and cognitive ability were also related to storybook reading measures. Our question was: Are hassle level associated with the child's developmental delays and the goals that mothers brought to

the interactions related to specific features of mother-child interactions during the storybook activity?

In a previous study (Schneider & Hecht, 1995), relations between maternal and child behaviours in a storybook reading interaction were investigated using Pearson's coefficient of correlation. In general, mothers' attempts to involve children in the story-telling process were correlated with higher involvement on the part of children. The more the child responded to her requests to participate, the less the mother described the pictures herself and the more she requested the child to do so. The same interactional data were used in the current study to investigate relations between adult and child behaviours in storybook reading interactions, parental goals, and hassle level.

Method

Sample

Each of the 28 families in our sample had a child with a developmental delay by the age of three or earlier, identified by a professional or an agency. Table 1 displays the mean chronological age and test score results on a number of standardized measures. The 28 families were selected from 102 families who were participating in Project CHILD, a study of family adaptation to children with developmental delay (Bernheimer & Keogh, 1986).

Seventy-three agencies in the greater Los Angeles metropolitan area assisted in the assembly of the Project CHILD cohort. Public schools and private intervention programs constituted two-thirds of the cooperating agencies. Some pediatricians and private school professionals were also used. A total of 313 children were identified as possibly appropriate for the study by these agencies; 102 families were entered because they met sampling criteria (described in the paragraph below) and the parents consented to participate. An additional five percent of the 313 children were confirmed as meeting sampling criteria, but either the parents declined to participate or the cooperating agency advised against contacting the family.

This procedure yielded an initial sample of 102 families with a child three- to four-years old who had significant developmental delays of unknown origin. Children with known genetic abnormalities were excluded from the sample, as were children whose developmental

Table 1
Ages and standardized test scores¹

| | Mean | SD | Range |
|---------------------------------|------|------|--------|
| Chronological Age | 55.8 | 3.7 | 48-62 |
| Gesell Developmental Age (mos.) | 39.7 | 8.4 | 22-53 |
| Gesell Developmental Quotient | 71.7 | 15.5 | 44-96 |
| Gesell Language Age (mos.) | 38.3 | 8.1 | 21-54 |
| Gesell Personal-Social (mos.) | 41.9 | 9.2 | 23-63 |
| Stanford-Binet IQ | 66.5 | 17.4 | 37-109 |
| Stanford-Binet MA | 43.3 | 9.8 | 24-65 |

¹Note that for some tests, the range extends into the normal range; this is possible because children could be chosen on the basis of delay on cognitive scores only, linguistic scores only, or both cognitive and linguistic scores.

delays were associated with prenatal alcohol or drug abuse, or postnatal neglect or abuse. In order to minimize the effects of complex cultural and linguistic influences, the sample was restricted to one ethnic group, European-Americans. We have described these families and their children with developmental delays in several previous papers. A more extensive account of the sampling procedure appears in Gallimore, et al., (1993). The longitudinal Project CHILD data indicate that while some children with developmental delays prior to age three "catch up", the majority continue to lag behind age norms on standardized tests of development and cognition, and most are placed in special education classes once they enter school (Bernheimer, Keogh, & Coots, 1993).

As it was not possible to undertake the book-reading task with the full sample, 28 families were selected from the 102 in the full sample, representing the middle-class socioeconomic range and the younger

children of the sample. At entry, the mean chronological age of this sample of 28 was 37.5 months (SD = 6.2; range = 32-42). The mean Gesell DQ was 71.12 (SD = 14.57; range = 45-97). Table 1 lists standardized test scores at the time of the study, when the mean age was 55.8 months. Twenty-nine percent of the families were headed by single mothers; 29% of the mothers and 26% of the fathers had high school or less education. All but one of the fathers were employed, and 46% of the mothers were working. The median family income was \$30,000 to \$49,000. All 28 children had significant developmental delays in one or more areas (motor, speech, behaviour, or cognition). Sixty-eight percent of the children were boys.

Procedure

Several types of information were collected for the CHILD cohort, including: open-ended interviews focusing on the child's developmental history, family characteristics, family accommodations, and daily routines; questionnaires on family characteristics and routines and on family goals for the child's development; and developmental test scores on the children. From these data, the measures of parental goals, hassle level, and child developmental level were derived for the purpose of this study. Each is described in detail below.

Parents' goals for child development

Parents were shown a list of developmental goals and asked to indicate the importance of each for their child, and the interviewer then rated each goal on a nine-point scale according to how important that goal was to the parent. (See Table 2 for a list of the goals). The rating took into account not only the response to the specific items shown in the table, but also parent comments made during the interview that bore on that goal. A reliability check was conducted on 12.5% of the fieldworker ratings; point-to-point percentage agreement ranged from 78% to 100%, with an overall agreement of 82%.

Hassle level

Hassle is a term we adopted from parents' own usage, and we have used the term to discuss family accommodation elsewhere (Gallimore, Coots, Weisner, Gamier, & Guthrie, 1996; Schneider & Hecht, 1995; Weisner, Matheson, & Bernheimer, 1996). It is defined by parental reports and observer ratings of characteristics associated with the child's developmental delay, such as communicative, behavioural, motor, medical, and/or interactional characteristics. Families with high scores on hassle level have children whose developmental delays

present many problems in everyday life. The hassle level was rated in Year 1 of the study by fieldworkers as follows: Nine-point ratings were made by interviewers of problems that the child's developmental delay created for the family in their everyday lives, including separate ratings of medical hassles, behavioural hassles (e.g., tantrums, etc.), communicative hassles (hard to understand, nonverbal, etc.), high frequency social hassles (attention-seeking, interrupting, etc.), social unresponsiveness (ignores, does not respond to others, etc.), and socially inappropriate and objectionable overtures. These ratings were summed to obtain a single hassle level score for the family. Agreement for hassle ratings (within one scale point) was 75%.

Child developmental measures

At Year 3 of the study, when the storybook reading interactions were observed, developmental status was assessed using the Gesell Developmental Schedules and the Stanford-Binet Intelligence Scale.

Socioeconomic status - The Hollingshead Four Factor Index of Social Status (Hollingshead, 1975) was used to measure SES, based on the father. Where there was no father in the family, the mother's status was calculated.

Storybook interaction measures - These measures were obtained from observation of interaction between the mother (who was the child's main caregiver in all cases) and the child in a single session. Each dyad was given a picture book, *Good Day, Carl* (Day, 1985), which is wordless except for the first and last pages, and was asked to look at the book together as they normally would. Interactions were audio- and videotaped in their entirety and were later transcribed for analysis (see Schneider & Hecht, 1995, for a complete description of the procedures and analyses for the book-reading interaction).

Coding of the data focused on the relative roles of mother and child in the book-reading activity. An utterance-based coding system was developed to identify the following features:

- 1) Maternal utterances that involved telling the story in the book were coded as either descriptions (in which the mother provided the story information herself) or requests (in which she attempted to get the child to provide story information). The resulting variable, M Requests, was the proportion of all story-related utterances that were requests for the child's participation.

2) Child utterances that were responses to M Requests were identified. The resulting variable, C Responses to M Requests, was expressed as a proportion of number of requests made by that child's mother.

3) An additional variable, Total Number of Utterances, consisted of the total number of mother utterances during the interaction, and is included as an estimate of length of the interaction.

All proportional data were transformed using the arcsine transformation. Point-to-point coding reliability was determined to be .92 (Cohen's kappa) for these variables.

It is worth noting that ecocultural and interactional characteristics of the families were independently measured. Interaction data were collected and coded by different personnel than the ecocultural data (which includes parental goals and hassle level). Hence, any associations between ecocultural and interactional data were not due to contamination of one set of data by expectations concerning families or hypotheses derived from the other, nor from coding bias stemming from the same kind of problem.

Results

Using Pearson's coefficient of correlation, the data were examined for correlations between the parents' goals for child development and child hassle level on one hand, and the storybook reading interaction measures on the other. We found many correlations between the selected ecocultural variables (hassle level, parents' goals for child development) and interaction variables derived from the book-reading activity.

Hassle level

As originally reported in Schneider and Hecht (1995), hassle level was significantly correlated with all four measures of interaction coded from the book-reading activity data. These results are reported here in line 1 of Table 2 to enable comparison with the correlations between parental goals and interaction variables. The higher the child's hassle level rating, the shorter the interaction (as measured by total number of maternal utterances). Children with higher hassle ratings responded a lower proportion of the time to mothers' requests to participate in the story-telling. Not surprisingly, mothers of children

rated higher on hassle level made fewer requests for child participation in telling the story; these mothers tended to tell the story themselves.

Table 2

Correlations between ecocultural and interaction variables

| Interaction variables | Length of interaction (in utterances) | M requests C to tell story | C Responses to M requests |
|---|--|----------------------------------|---------------------------------|
| Hassle level | -.45* | -.48** | -.57** |
| Goal to take things day by day | -.37 | -.46* | -.33 |
| Goal to center daily routine around child with DD | .31 | .54** | .32 |
| Goal teach skills to child with DD | .57** | .64*** | .39* |
| Goal to parent and nurture child with DD | .48** | .51** | .48** |
| Goal to do special things for child with DD | .50** | .65*** | .28 |
| Goal to do everything to "push" child with DD | .50** | .43* | .19 |
| Goal to improve language of child with DD | .42* | .54** | .26 |

* $p < .05$ ** $p < .01$ *** $p < .001$

Family goals for child development

We expected that parents who actively involve their children in the storybook activity (parents who, as we have seen, tend to have relatively low-hassle children) are more likely to believe that they can influence development, and correspondingly set goals to influence development, than are parents who involve their children less in the reading activity (and whose children tend to be more difficult to involve in interaction). Lines 2-9 of Table 2 present the correlations between parental goals and child-mother interaction.

These data support our expectation. The goal of "taking things day by day" was negatively correlated with proportion of book-reading utterances in which the mother requested the child to tell a part of the story. We take this to mean that mothers who can give more responsibility to their children for the story-telling task can also plan their routines a bit more, and believe that their children can and should co-participate in story reading. The other goals, such as teaching skills to the child, parenting and nurturing, doing special things for the child, and pushing the child's development, were positively correlated with mothers' requests for the child's involvement. Nearly every goal was correlated with the number of utterances as well; mothers who had goals of parenting and nurturing the child, doing special things for the child, improving his or her language, and generally pushing the child, tended to keep the interaction going longer (as measured by utterances) than mothers who were rated lower on these goals.

Developmental assessments of the child

As expected, based on the work with accommodation at the family level (Gallimore, et al., 1993), developmental test scores from the Gesell Developmental Schedules and Stanford-Binet Intelligence Scale were not correlated with either the ecocultural variables or the interaction variables. This suggests that families make neither distal nor proximal accommodations to developmental factors tapped by conventional testing. The absence of a relationship parallels what many parents have told us about family accommodation: Test scores tap factors that are not really the issues that drive families' responses to children with developmental delays in the ranges we sampled. Low test scores document a child's developmental delays, but are not associated with accommodation activity at any level. At the family level, accommodations were associated not with developmental test scores but with the child's impact on the daily routine. In interaction,

mothers appeared to be basing their behaviours on the willingness of the child to participate, rather than the child's developmental age or quotient. If the child was willing, then he or she was asked to participate in telling the story in some way.

SES and Maternal Education

We also investigated whether the distal measures of SES and maternal education, often cited as important predictors of interactional variables, were related to interaction in the present study. We found few such relationships. Maternal education was correlated only with Total Utterances, and SES was correlated only with M Requests. To see whether these correlations had an effect on the relationship between interaction and ecocultural variables, we partialled out the effect of Maternal Education in correlations between Total Utterances and ecocultural variables, and partialled out the effects of SES in correlations between M Requests and ecocultural variables. Table 3 displays the results. As compared with the original correlations for Total Utterances, the correlation with Child Hassle Level was no longer significant, nor were the goals of teaching language, to parent and nurture, or to do special things for the child. Still significant were the goals to teach skills and to push the child. For M Requests, two variables were no longer significant: the goal to take things day-to-day and to do everything to push the child with developmental delay. It is possible that these related goals (which had been correlated in opposite directions from one another before partialling out SES) may be influenced more by some aspect of SES rather than by characteristics of the home and family members. In general, then, Number of Utterances (which we consider a measure of length of interaction) was affected by partialling out SES, while M Requests, a measure of actual maternal behaviour within the interaction, was not greatly affected by removing maternal education. Maternal education may have some aggregate statistical influence, of course, but our results suggest that context measures like parental goals or family daily routine are as or more related to storybook reading interaction and have the advantage of being more directly relatable to the everyday activities and experiences of parents and children.

Table 3
Partial correlations

| Ecocultural variables | Total Utterances with M Education partialled out | M Requests with SES partialled out |
|--|--|--|
| Hassle level | -.32 | -.56** |
| Goal to take things day by day | -.18 | -.25 |
| Goal to center daily routine around child with DD | .25 | .42* |
| Goal to teach skills to child with DD | .56** | .72*** |
| Goal to parent and nurture child with DD | .26 | .55** |
| Goal to do special things for child with DD | .38 | .65*** |
| Goal to do everything to "push" child with DD | .50* | .34 |
| Goal to improve language of child with DD | .36 | .55** |

* $p < .05$ ** $p < .01$ *** $p < .001$

Discussion

Mothers based their behaviours in the storybook activity on a combination of the specific task requirements of book reading, past experience of the child, and their goals for the child. Our interpretation is that mothers brought to the storybook activity a prior schema about how their child would respond to such an activity, and used that schema, as well as their goals, in engaging in interactions with their child around the story. That prior schema is in turn shaped by the child's hassle level, and their experience in accommodating their everyday activities to the child's developmental delay.

These relationships are clearly seen in the videotaped interactions: When dyads contained high hassle-level children, mothers were faced with difficult children who were not interested in books, or who preferred to look at the books alone. These mothers moved rapidly through the activity before the child ran off or acted up. In dyads with low hassle-level children, children clearly were interested in the book and in interacting with their mothers, who were thus able to spend more time in the activity and to request their children's participation in the telling of the story. Thus mothers tailored their responses in ways that allowed for successful interaction, given the characteristics of the child. The definition of a "successful interaction" necessarily differed as a function of the hassle level of the child and consequently on the child's willingness to participate in the activity. For a mother of a child who is characteristically unwilling to participate in book-reading activities, a "successful" interaction might mean that the child stays in one place and occasionally looks at the book; such an interaction is successful for this dyad because it is the highest level of engagement that she has been able to reach with this child, and is possibly the best level at which he or she can be engaged at that particular point in time.

The fact that hassle level (measured in the first year of Project CHILD) and interaction behaviours (measured 1-1/2 years later) were related suggests that some difficulties that mothers experienced within the storybook interaction were a function of a more global child characteristic. That is, mothers of children with high hassle level ratings were accommodating their behaviour not just to a momentary lack of responsiveness on the child's part, but a general tendency to be difficult in interactions -- a tendency learned and adapted to by mother and child long before parents and children participated in our storybook activity. Mothers' attempts to engage the child actively in the storytelling itself, as measured by her requests to the child to tell the story, are related not only to hassle level and its effect on interaction but also to her goals for the child's development.

This has important implications for intervention programs that focus on changing behaviours of family members: We predict that maintenance of newly acquired interaction behaviours is dependent on how congruent they are with proximal features of the daily routine. Families are unlikely to maintain intervention-trained behaviours if they are not congruent with family goals and hassle level. For example, if parents do not believe strongly that they can influence the development of

their children with developmental delays, have not themselves formed goals to teach and push their children, and have had to accommodate their interactions to their children's high hassle level, they are unlikely to implement the techniques learned in an intervention program, however sound the principles of that program may be, unless the program has attempted to take these factors into account in some way. Taking such factors into account in turn requires careful discussion with parents to find out about them before standard interventions are advocated. Parents have to achieve, each day and week, a routine of family life that they feel is meaningful to them, can be sustained, given their resources in their community, and is balanced across inevitably competing interests of family members. Storytelling must fit into this broader adaptive challenge facing families (Weisner, Matheson, Coots, & Gallimore, 1997).

Storytime interaction differs in these families depending on the child's willingness to participate, the hassle level associated with his or her developmental delays, and the goals families have set with regard to the child with developmental delays. Hence, "success" in story reading cannot, in our view, be understood without including in such assessments an analysis of the context in which that interaction occurs for that family. Mothers take what they have to work with to construct the best possible storytime interaction -- given all their other, interrelated accommodations they have put together to organize their everyday activities and daily routine. A short and mother-directed book-reading task for a family with a difficult child cannot by itself be viewed as "unsuccessful." The adaptive context of such a family must also be considered, including all they have factored into sustaining their daily routine. Our results indicate that family goals and child characteristics are taken into account by mothers in their interactions. This is not to say that they could not benefit from intervention, focusing on maximizing the developmental benefits of parent-child interactions. Interventionists must be aware, however, of the complex family ecology to which interventions must be tailored if they are to be implemented in the family context.

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Address of first author:

Phyllis Schneider, Speech Pathology and Audiology
University of Alberta, 2-70 Corbett Hall
Edmonton, AB, Canada T6G 2G4
email: phyllis.schneider@ualberta.ca