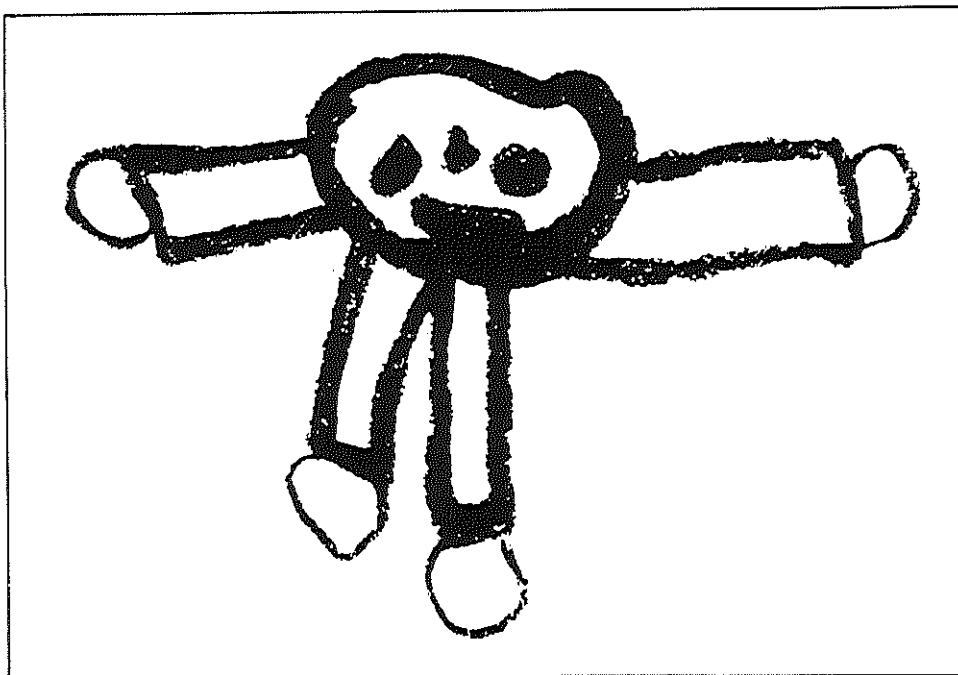


Edith H. E. Churchill
and Joseph N. Petner, Jr.

**CHILDREN'S LANGUAGE AND
THINKING: A REPORT OF
WORK-IN-PROGRESS**



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University of North Dakota
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Joseph N. Petner, Jr.

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In November 1972, educators from several parts of the United States met at the University of North Dakota to discuss some common concerns about the narrow accountability ethos that had begun to dominate schools and to share what many believed to be more sensible means of both documenting and assessing children's learning. Subsequent meetings, much sharing of evaluation information, and financial and moral support from the Rockefeller Brothers Fund have all contributed to keeping together what is now called the North Dakota Study Group on Evaluation. A major goal of the Study Group, beyond support for individual participants and programs, is to provide materials for teachers, parents, school administrators and governmental decision-makers (within State Education Agencies and the U.S. Office of Education) that might encourage re-examination of a range of evaluation issues and perspectives about schools and schooling.

Towards this end, the Study Group has initiated a continuing series of monographs, of which this paper is one. Over time, the series will include material on, among other things, children's thinking, children's language, teacher support systems, inservice training, the school's relationship to the larger community. The intent is that these papers be taken not as final statements--a new ideology, but as working papers, written by people who are acting on, not just thinking about, these problems, whose implications need an active and considered response.

Vito Perrone, Dean
Center for Teaching & Learning,
University of North Dakota

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Introduction

This monograph represents an effort to critically examine and reflect upon a year's exploration in the use of children's language--observed, recorded, and analyzed--as a basis for staff development.

The beginnings of this work were sparked by concern about the kinds of evaluation carried out largely through standardized testing--a practice that, at best, has focused on absolute measures of success and failure, narrowly ranking and comparing children on the basis of their responses to a set of test items, and, at worst, has served to obscure and make inaccessible information from which to consider the full range of children's thinking, as well as the degree to which the educational setting supports the individual child in his learning.

In our work as support staff to teachers, we have been hard pressed to find sufficient or useful information from standardized testing measures. Instead, what we feel the need for are processes which provide information in relation to specific classrooms and the program goals. These processes should reveal not only the content of children's learning but the meaning that the children derive from what is learned and the use to which it is put. They should have the capacity to describe why or how these outcomes did or did not occur and thus provide a basis from which to guide our decisions about practice. They also should encourage active participation by teachers, parents, children, and administrators. We assumed that our staff development model using children's language would result in records of children's progress which would provide this kind of information.

Initially, we set ourselves the task of understanding how these processes could be expected to develop. We had proposed developing them in relation to observing and recording children's conversations among themselves within the classroom setting, using the content of these observations for planning curriculum and assessing children's progress, and utilizing the documentation of this process as a basis for evaluating program effectiveness. The reality of piloting and developing this methodology has served to underscore the difficulty in utilizing this kind of data in relation to program evaluation. Our experience indicates that, before realistically undertaking an exploratory study from which new and more responsive methods for assessing and recording program development

We wish to thank our many friends who have encouraged and assisted us in the presentation of this material. Special thanks to the teachers, Judy Musco and Irma Stratton, whose enthusiasm and interest made this study possible. We are particularly appreciative of the encouragement of Vito Perrone, without which this material would not have been shared. Finally, we thank Patricia Carini and the staff of the Prospect School Adjunct Services for their generous assistance in the analysis and organization of the material in this case study.

can emerge, we need first to continue to improve our skills in observing and recording. Second, we need to develop ways of describing and documenting the relationship between what we know about a child and what we do to assist him in his learning.

One Step in a Large Process

We now realize that the relationship between the staff development process described here and program evaluation is not a direct one, but only one step in a much larger process. The staff development process leads to more accurate observation and informative record-keeping. It will not automatically result in the next step, i.e., the translation of records and information about children into a form which is useful for program *documentation*. This becomes a separate task and probably not something that teachers can realistically be expected to undertake. Finally, educational decision-making based on documentation rather than standardized tests represents a third level of exploration.

We do see a connection between staff development and evaluation and continue our interest in developing this link-up. However, since we believe that the first and essential step for this kind of evaluation is the teacher's knowledge of the child, we have concentrated our effort, up to now, on the development of a staff support model which will assist teachers and ourselves to deepen our knowledge about the children and the teaching/learning process.

Specifically, we were interested in establishing an active, work-related dialogue that, through a study of the child, would provide teachers with an opportunity to reflect on the teaching/learning process and that, at the same time, would provide a format where we, as staff developers, could participate as partners in the study. The framework we developed to accomplish this purpose was as follows:

1. Recording children's actions and spontaneous speech among themselves to provide a concrete starting point from which to strengthen our skills in listening to and analytically observing what children say and do.
2. Participating in workshop discussions about the meaning of the observation in relation to child development, and in relation to what is revealed about the individual child's themes, interests, strengths, and learning personality.
3. Translating information from these observations and related discussion into curriculum planning.
4. Selecting a few children and developing and

maintaining a documentation representative of their developmental level, interests, and friendships.

In developing this model, we placed a great emphasis on the child and his learning--which means recognizing the importance of relating to children as individuals and meeting children's individual needs. We see all children, whatever their background, as having the potential for being active, curious, and intelligent, see them as natural learners, and believe that the school, to the extent that it is tuned in to the curiosity, interest, and perceptions of individual children, can provide for and enrich their learning possibilities.

In this context, the teacher's role in the classroom is critical, but not always directly instructional--or interactive; it has more to do with expressing, in words and actions, a respect and consideration of each child and his way of seeing the world than 'covering the curriculum,' albeit while still 'covering the curriculum.' This requires that teacher expectations for the young child (4- to 8-year-olds) be related to the conceptual framework from which the child views the world and to the thought processes which determine that framework. It means *seeing* a connection between the child's emotional, social, physical, and cognitive growth, *seeing* a developmental sequence in the child's thoughts and action, *seeing* the child's unique style of learning.

To organize and run a classroom with these expectations is a complex task, demanding skills not necessarily critical for conducting a traditional program with a pre-designed curriculum. It also requires a capacity for re-appraising one's role and bringing into question its basic underlying premises and assumptions. Within that context, the job of staff development requires no less. It is inadequate for a staff support pattern to be limited to introducing concept-based curriculum, room arrangements, alternative teaching strategies, and staffing patterns--support which could be described as 'teaching old dogs new tricks.'

These concerns guided the development of the actual procedures that we followed in the pilot study. A staff developer taped vignettes of children's conversations and delivered typed transcripts of those conversations to teachers. Three tapes were made in November 1975 and a fourth was made the following January. In March, a group of children spontaneously decided to assume the role of interviewers in a television format, to provide the fifth tape. In May, a final tape was made, but in contrast to earlier tapes that recorded ongoing classroom activities this tape recorded an activity specifically designed to gain information about particular children: the teacher selected the children and chose to observe at the clay table, where conversation could be expected to occur.

These six tapes of conversation provided the data for seven staff development workshops over the period from November to June. The transcriptions were always given to

the teachers sufficiently well in advance of the workshops to allow everyone to become familiar with the material. The workshops were centered around jointly considering the observations. We discussed them for what they revealed about the children's developmental level, their learning style, their strengths and interests, and for what they suggested about curriculum extensions. The typed transcripts of these workshops, in turn, became part of the content for subsequent workshops. Thus, we had a cumulative, shared record of children's conversations and teachers' and staff developers' responses to the conversations. These responses include plans to determine the direction and emphasis of ongoing observations and consultation. Together with the children's statements, they form the data for our study.

As we worked supporting staff development, we came to spend more time talking to and with teachers about children's growth and development than about child language. What follows is by way of a report-in-progress of those discussions, showing a sampling of the data, the commentary it generated, the questions we are left with, and some thoughts about where we go next.

Staff Development

DEVELOPMENT OF THE TEACHER TRAINING MODEL

The class in which we worked was a K-1 grouping used in the Follow Through approach sponsored by Bank Street. The class had 20 children, eight of whom were first graders. The school day ran from 8:30 a.m. to 2:30 p.m., but the 12 kindergarten children left at 12:30 p.m. Both teacher and teaching assistant were experienced, were committed to a child-centered rather than a lockstep approach, and had joined the study voluntarily.

However, we had not worked with the teacher or her assistant prior to the beginning of our study. We were, therefore, all breaking ground both in terms of our relationship to each other and in initiating a process of support based, to a large extent, around the observation of children, as previously outlined. It is important in considering the early workshop sessions to realize that at the beginning of our study we had little knowledge of the teachers' curriculum, or their set of goals for the children, or their concerns vis-à-vis their teaching. Our relationship with the teachers was strongly influenced, however, by our belief in the importance of maintaining a process of staff development based on mutual concern for the children and their learning, and avoiding any situation which would place the teachers in the position of defending themselves.

The classroom was organized around interest centers: blocks, sand, tinker toys, housekeeping, hospital, puppets, listening area, reading, painting, clay, etc.; a variety of activities were offered, and much of the day was devoted to children working at the activities of their choice. The teachers had made a special arrangement by which they could serve the children lunch in the classroom instead of taking them to the cafeteria. Thus, we had a situation which provided ample opportunity to collect samples of children's spontaneous conversation among themselves.

The actual taping was done by Posie Churchill, acting as participant-observer in the classroom. The transcript of the first observation is included here almost in its entirety to illustrate the kind of material we used as a basis for our workshop discussions with the teachers. Some additional information about what was going on in the classroom has been added to the original

transcript and appears parenthetically.

Children's Conversation, No. 1 (November 21, 1974)

At the sandbox, Kathleen and Rosie settle down to sifting the sand, humming, and singing snatches of songs at the same time. (The sandbox is immediately adjacent to the block corner.)

30-40-40-
Everywhere you go
People want to know
who we are.
So we tell them.
We're from . . . ?

You live at Chestnut Park?
No, I live on Plympton Street.

(As they begin talking to each other, they attract the attention of the boys in the block area, who join in the conversation.)

I know where you live.
Bobby knows where I live.
So what. I know where you live, right?
No, she doesn't.
I live in Cambridge and I live in a grey house and I live upstairs.
You live in a different house than you lived last year.
I live in the same house with you and I live with you--
right? The same door.
Hey--she lives in the same door as me.
Uh, uh, I live in Cambridge.

(The sandbox activity ends and I turn my attention to a very small four-year-old (Douglas) and a slightly older girl (Kitty) who is large for her age. The children are making the simplest possible constructions from Tinker Toys. There was some confusion here on my part as the children, none of whom I really knew, drifted in and out of the activity.)

9:28

Kitty He didn't even cry. He
didn't even die.

Douglas Look at this.

Kitty 'Member we moved.

Douglas Right out the window.

Kitty Will the cops come up?

Douglas This is a boat.

(to me) Will you take care of
this?

(Douglas leaves the construction.)

Kitty Douglas made this, so we
fix it back together--right?

Douglas I went over to your
house and you went over to my
house. Is your mother home?

Kitty No--she's at work.

Douglas Your mother's at work,
huh?

Kitty My mother's always at work.

(Douglas leaves. Kitty notices that I wrote her name and asks me what I wrote. I say, 'your name, so I can remember it.' I start to print it for her.)

9:32

Kitty That's not how you spell it.
Here--I'll write it. *(rewrites
iKtty)*

O I think the *i* belongs over
there.

Kitty It does, but I don't want
to write it there. 'Cause every
time I write it, if I'm only
making one mistake, then someone
can read it.

(Children return to Tinker Toy activity.)

I ain't going to make what you're
making. If you want to make what
I'm making you better hurry up.

Why?

'Cause I leave when I want to
leave. You're going to be here
by yourself. And I'm only making
one thing 'cause that I might
not be have time.

Throughout the text, O
is used to designate the
participant-observer in
the classroom, and O1 and
O2 to designate the staff
development team during
workshop discussions.
The names of the children
are fictitious.

You hurry up. I'll do it but
I ain't doing it now. You
can't do it--you better make
something now.

9:36

Daniel I'm going to shoot you.
Kitty Come on, make something.
Daniel I got my boat all done.
Kitty I'm making a boat.

Daniel shows a boat made from one purple rod and elastic with two red cross pieces. He adds more cross pieces while he talks. He stretches elastic to hold two rods together. Kitty makes a construction that has some warlike purpose.

Daniel Look what I did.

9:40

Curly is making an Indian headdress from paper, with oval paper "feather" attached. Artie is watching.

Curly See my Indian hat. My
feather is fat. I can see
it.

O It doesn't seem to stand up.

Curly I'm going to make it
smaller.

It's too big.

I can color it in, right?

(to Artie) Want me to make
you feathers?

Artie They look like hot dogs.

It keeps falling off me.

Why? My head is too small.

Curly Make the headband
smaller

Curly makes stereotype Indian war whoop noises. He makes four ovals and cuts them out. Makes more noises. Makes head-dress for Artie. It is much too large.

Curly uses stapler to make headband smaller. Both boys go off making Indian noises.

10:07

Conversation is mostly monologues.

I'm making a Batman car.

Mine's a missile.

I'm going to make a drill out
of this--I just made a drill.

That's an airplane

O What makes it an airplane?

It has this and this.

(Indicating one stick as the body
and another as the wing)

Daniel and Kitty are making very simple Tinker Toy constructions.

Boys switch to rocket ship and airplane.

Douglas, Jeff, Bobby have joined the group. They figure out how to use Tinker Toy sticks and elastics like bow and arrows.

Don't take the big ones first--
please take the small ones.

Boys experiment with shooting arrows.

Lawrie and Catherine at sandbox.

Lawrie Put hot sauce on it-- *He fills a conical cream
hot sauce, hot sauce. container and pours it
over his bowl of sand.*

10:30

Lawrie I don't need any more hot
sauce.

(to girl) You make your own
stuff. Cheese for the pizzas
that the pizza parlor makes.

Catherine A birthday cake. I
have to put two cups of sugar.
I know how to cook at home.
Popcorn.

*Cleanup is announced. After cleanup, the children are
called together for a game involving going "over-under-or-
around" furniture and selecting a designated Cuisinaire
rod. The game is organized by the assistant teacher while
the teacher collects lunch from the cafeteria.*

Kathleen goes under the table when asked to go around.

Daniel Completely all the way around?

Steve You didn't go all the way
around.

*Most children do as asked. Some miss one direction or
bring the wrong rods.*

*The children take places at the tables, pass out plates,
forks, and napkins, and converse while waiting for lunch
to be served.*

Lunch table: Corrine, Daniel, Rosie, and Artie

Corrine You, then you, then you,
then me.

Rosie She's going to be first

Daniel You going to be *real*
last.

Rosie What if teacher calls
Corrine?

Artie Then she will be last.

Artie *(Reading numbers on forks)*

A 4 and a 2. I got a 4 and
a 2.

Daniel I got 22.

Artie Curly got more than you.

Rosie *(to Corrine)* You have to
serve yourself, so you are
last.

*Lunch table conversation continued.
Curly speaks, and other children
(OC) chime in.*

Curly I don't chew gum at school
at all,
Other children Me 2, me 3, me 4.
Me 5, 'cause I'm 5.

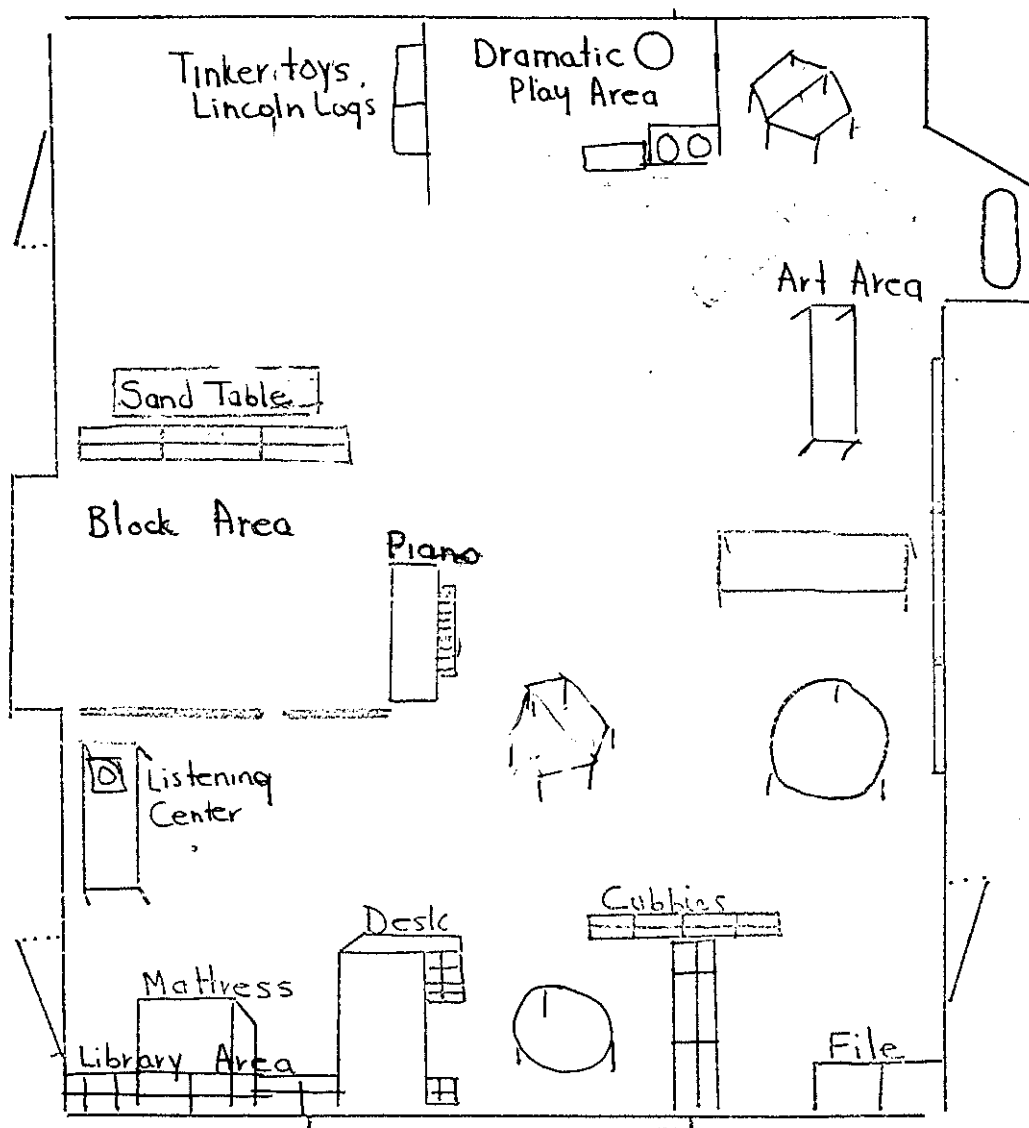
This represents practically the total transcribable conversation from a 2-1/2 hour observation. Posie Churchill explained at the end of the observation that, while she recognized the conversations as typical for a K-1 classroom, she was convinced that there would be nothing on the tapes that would be useful or of particular interest to the teachers. Even though she had no teaching responsibility, and could focus her whole attention on what the children were saying, voices were so difficult to pick up and things happened so fast that the significance of the children's statements escaped her at the time. It was only after she had transcribed the tape and we had the opportunity to reflect on the transcriptions, as we planned for our first workshop, that we realized we had material that was ideally suited to initiate a discussion about the children.

The first taping also pointed to some of the technical problems associated with recording in an active classroom. It was sometimes difficult to distinguish one voice from another. As an aid to transcription, we found that it was essential to keep notes about the activities, the children participating, and their key phrases. Such observation was also important to provide the context for conversations. What children were doing with the materials, and in their play, was as informative as what they said; to make accurate assessments of children's thinking, we needed both kinds of information.

Another consideration about the actual recording process was that while the snatches of conversation in the first tape were informative, we felt it was desirable to get more continuity and content in the recorded material. For this purpose, we decided to focus on a few children over a longer period of time, rather than attempting to pick up isolated comments from many children. To do this, we needed to tape an activity where a group would stay together. Thus, our second and third tapes recorded the conversation, first, during a weaving activity, and, second, while children were working with miniature animals. Each observation ran approximately 45 minutes. On the basis of these three tapes, we conducted two workshops which formed the 'beginnings' for our staff development process.

The Process: Beginnings

Certain characteristics of the beginning stages of the process seem worth noting. Initially, the discussions in the workshops were focused around and limited to the literal content of the taped material. The transcribed conver-



sations described and made it possible to reflect on what the children were actually saying. They provided a way to reflect back to the teachers the 'stuff' that was going on in their rooms at a time when they were free from the constant demands of the teaching day to consider it. One teacher's comment--"I find it incredible that we could get so much from these; I guess if I had really read it three or four times, I might get more"--confirms our sense that the tapes provided the teachers with information about the children beyond that which they could gather for themselves. As we reviewed the children's statements together, many topics for discussion were identified.

We were surprised, when we reviewed our data, to find that by the end of the second workshop we had touched upon most of the topics which were explored in more depth later in the year. The fact that so many topics surfaced from only three taped conversations reinforces our original conviction about the value of listening to what children are saying as a way of learning about them. Since only a few of the topics that we discussed are illustrated in this report, we are including an outline of the total topic content to give a more complete picture of the range of subjects identified during the first stage of our work.

A. Developmental Level of the Child

Mathematical concepts

- pre-number concepts: taller, shorter, longer, more, less, the same, first, last.
- topological relationships: child's orientation in space.
- conservation of volume.
- conservation of number (numbers as symbols for quantity as opposed to numbers as words or labels).
- classification.

Language development (types of conversation)

- monologue: speech as accompaniment to action.
- parallel conversation: children talking on the same subject but not paying attention to what the other person is saying or trying to communicate.
- orders and commands.
- exchange of information.

Child's Map of his world

--in relation to events: the child relates events to himself or to the outside world.

--in relation to objects: the child represents objects through symbolic forms and action or makes realistic representations.

B. The Child as an Individual

Learning style

--auditory, visual, or kinesthetic; what is the child's primary mode for learning about his world: his eyes, his ears, or his fingers?

Analytical or constructive: what is his primary mode for problem solving?

--if he is making a puzzle, does he visualize the whole and look for the right pieces to complete the picture, or does he construct the puzzle by trying pieces at random until he finds the one that fits?

Interests

--activities and topics with special appeal for the child.

Strengths and competencies

--where is the child particularly successful: drawing, painting, building, motor construction, social interaction?

C. Record-keeping

--identification of friendship groups as support structures for children.

D. Curriculum

--cooking; the family (graphs, family books, interviews with parent).

--rhymes, rhythms, and sound

--measurement (models, box collage, volume material for sand).

In planning workshop discussions, we looked at children's statements initially for evidence of their developmental level--information that is important for learning about the individual children and essential to planning

appropriately for them. In our contact with the teachers, we have heard them talking a great deal about trying to really focus in on the children in their teaching; that they were attempting to accept children where they were developmentally and extend their learning from there. To consider the fullness of what it means to accept a child "where he is," certainly requires, we believe, an ever-increasing awareness of his present stage of development. Holding this consideration in the forefront of one's mind is often difficult because it assumes the teacher will spend a large portion of time learning about a child despite pressures from curriculum guides to be teaching this or that concept. It assumes, also, that the teacher has a background in child development theory sufficient to understand and analyze a child's development, despite the heavy emphasis in pre- and in-service training on "how and what" to teach. Which is not to say that "how and what" are not essential components to becoming a teacher, but to raise some concern about the separation of the teaching of methods and child development into separate courses in teacher training. (Actually, the teachers who participated in our study would probably say they had identified a need to extend their understanding of child development; at least we attributed their willingness in participating as evidence of this interest.)

Children's Mathematical Thinking

Because mathematical thinking and concept of numbers is an area where the child's level of maturation is easily recognized, and where the child's concept of development can be directly connected to curricular choices, we focused our initial discussions on this area. The excerpt from the taped observation that follows illustrates that children do, by themselves, independently and spontaneously, explore mathematical concepts. Recognizing children's work as exploration, and being able to value it, seems critical to the whole teaching enterprise of knowing when to follow up the threads of discovery so that the child's understandings are extended:

Workshop Discussion

Note: It should be fairly obvious that throughout this monograph the material that appears in the left-hand margin is drawn from classroom conversations, unless otherwise indicated, while the material in the right-hand column represents, first of all, what the staff developers and teachers said about the children's conversations and, secondly, commentary or description of one sort or another, wherever it seems appropriate.

Classroom Conversation

Kathleen and Rosie at the sandbox pouring sand over the plastic animals A Boy comes over.

R He got covered up, covered up.
B They're spozed to be in here. Give us all the animals.
R We don't have them. We just have three of them.
B You got any more? King Kong's spozed to be in there.

01 She said, "We have only three--give us all the animals --we don't have them--we have only three." At least three isn't all. The question is whether three means three or just more than one.
T2 If Rosie said it, it means three because she knows three.
02 We felt you two could fill in the gaps because you know the kids, and this is that kind of gap.

At the lunch table: a discussion of who would be served when. Speaking are Corrine, Daniel, Rosie and Artie.

- C You, then you, then you, then me.
 R She's going to be first.
 D You going to be *real* last.
 R What if teacher calls Corrine?
 A Then she will be last.
 A (*Reading numbers on forks*) A 4 and a 2.
 I got a 4 and a 2.
 D I got 22.
 A Curly got more than you.
 R (*to C*) You have to serve yourself, so you are last.

Lunch table conversation continued. Curly speaks, and other children (OC) chime in.

- C I don't chew gum at school at all.
 OC Me 2, me 3, me 4. Me 5, 'cause I'm 5.
 C I'm 5-1/2, so I'm bigger than you.

- T2 In terms of the number 3--that is one thing that kids seem to recognize immediately.
 O1 They recognize the numeral or they recognize three as...
 T2 Right. They recognize it immediately. They can put three down and say how many and they don't feel they need to count. They may feel they need to count and they say three and then they make sure by counting. But after three it doesn't come so automatically.
 O1 At the lunch counter, they had some really nice numbers talk. "You, then you, then me." They were talking about who was going to be first and who last and then if the teacher calls Corrine "she'll be real last." Then they said "you have to serve yourself, so you'll be last." ... And then the forks. They were reading the numbers off the forks. I didn't know whether they had any connection to 42. They were reading and it was just a 4 and a 2.
 O2 It could have been 24. But, in either case, she didn't say 42. She said a 4 and a 2. But Daniel said he had more, but whether he was thinking of 42 or only that 4 is more than 2, I couldn't tell.
 O1 Another thing on the numbers: when they were talking about "me 2, me 3, me 4, me 5, because I'm 5." It seemed to be kind of an indication that they were not very clear about the difference between being 5 and the number 5 and what the relationship was between them.
 T1 They may--I think kids tend to turn things into an ego-centric thing even though they know. For instance, they write numbers into their names and they don't really think that it is their name. I've written numbers down and they will say, "I'm 5." I think it's just something that clicks.
 T2 When they said "'cause," they may not have meant it. They tend to have difficulty with connectives and sort of stick in a word. So when they said "me 5, 'cause I'm 5," it doesn't really mean that they see a connection.

It was clear how the discussion of the teachers' initial judgments about the significance of the children's use of number words, and about the word 'cause' as a 'mis-use of connectives left out any developmental consideration. By pointing out, as we did, how the child uses the

*Ann Bussis, Educational Testing Service, has stated in *Let's Look at First Graders* (New York: Board of Education): "A child may use 'because cause,' 'if,' or 'then' clauses long before he understands the notion of causal, conditional, or temporal relationship."

pre-number concepts of first, last, etc., and how he uses number names as labels, we had hoped to initiate an increased focus on the *child's* point of view. It is important for a teacher to be able to make that distinction because a child's language may be misleading--in that the grammatical use does not necessarily indicate the underlying logical thought. For example, as evidenced by the statement "me five 'cause I'm five," it is possible that the causal relationship does not yet exist for the child.* On the other hand, by continually observing and discussing it, you begin to build up the information which *will* reveal what that child *is* thinking and *can* do. For example, a child who is weaving with soda straws shows evidence, at least, that 'four' and 'five' are words which he is relating to quantity:

Steve, Curly, Lisa and Robert are talking while they weave soda straws.

S Hey--that was mine--blue, orange, red, and pink--and give me the scissors.

C Hey Steve, stop cutting and give me the scissors and don't touch.

R I can't do mine.

L What color you want this one?

S Yah, yah, I got red now.

R Hey Terry, take one of these dumb things away. 1-2-3-4-take that.

01 He glanced at the straws and saw he had too many, so he sure knows 4 and 5 without counting "1-2-3-4. Take that!" and he threw the fifth one out. I have the advantage because I know what he did.

T1 We know Robert, though, so we can imagine.

01 So we can say from this that he knows 4 and 5. We don't know if he knows more--he probably does. But children, even in second and third grade will count 5 rather than looking at it and saying 5. Children count 6 even though they know 6.

Spatial Relations

In another example of children's mathematical thinking, we asked the teachers to consider the children's understanding of spatial relationship as illustrated by their conversation of where they lived:

You live at Chestnut Park.

No, I live on Plympton Street.

I know where you live.

So what. I know where you live, right?

No, she doesn't.

I live in Cambridge and I live in a grey house and I live upstairs.

You live in a different house than you lived last year.

01 Maybe you can figure if you get any hints out of this Chestnut Park thing: It may have been Jefferson Park. I have a grandchild who lives on Lakeview Avenue and she knows I live on the same street, but she knows her address and she doesn't know mine. Maybe the same sort of thing is going on here. They really aren't differentiating between the town--"I live in Cambridge"--as opposed to living in the "same door with me." They really haven't jelled on the topology of the relation between the address and where they are which has things to say about what they would be able to do. A lot of people want to do mapping with children of this age and in my experience it really doesn't make much sense because they haven't got themselves oriented to directions and space and where things are.

I live in the same house
with you and I live
with you--right? The
same door.
Hey--she lives in the
same door as me.
Uh, uh, I live in Cam-
bridge.

T2 It makes sense if you do active things. If you took them to various parts of Cambridge; a lot of kids lack experience in getting out of their own neighborhoods. Last year, I took kids home with me and the second we left Washington Elms neighborhood they said, "I'm scared." It was amazing to me and it took them a long time to get a sense of Cambridge extending.

The teacher's response--attributing the children's confusion to lack of experience--took the discussion in the direction of considering curriculum which could extend their sense of the city. In retrospect, the discussion might have been more profitable had we continued it until we found out why the teacher felt that a lack of experience was the basis for the child's confusion, and how she would incorporate the experience of exploring Cambridge into her curriculum. We viewed this example as a missed opportunity on our part to ask the teacher to explore her understanding of the children's framework for dealing with this concept.

A review of even the first tape in our planning for the workshops made us realize that a focus limited to children's mathematical thinking was inadequate for dealing with the material. The children's statements did provide information about their mathematical thinking, but their ways of communicating with each other, and the representations they made of their view of the world, through their play, especially with these young school-age children, were equally important sources of information.

As the children conversed with each other, we found in their language particularly clear evidence of their developmental levels, which we continually pointed to in our workshop discussions. However, the teachers' interest in the children's language at this time centered on the curriculum ideas that the children's use of rhyme and sing-song generated. This will be discussed later when we consider how the workshops affected the curriculum. The developmental considerations implicit in the form of the children's language were not a topic that teachers were interested in discussing until late in the year.

We chose the example that follows as an illustration of how two children, seemingly in the same place, view the world from different frameworks: one seems to believe that what happens emanates from himself while the other believes he can influence events by his actions:

Child's Map of the World

Curly is making an Indian headdress from paper with oval paper "feathers" attached.

C See my Indian hat.
My feather is fat. I
can see it.
O It doesn't seem to

O2 Curly says, "See my Indian hat, my feather is fat, I can see it." Then Posie says, "It doesn't seem to stand up," and Curly says, "I'm going to make it smaller. It's too big." When the head band slips down to Artie's shoulders, Artie says, "My head is too small," but Curly says, "Make the head band smaller." There is a lot of clearness in his statement.

T1 (about Curly) We need to find out more of his interests. He does a lot of little projects. Something on-

- stand up.
- C I'm going to make it smaller. It's too big....I can color it in, right?
- C (to Artie) Want me to make you feathers?
- A They look like hot dogs....It just keeps falling off me. Why? ...My head is too small.
- C Make the head band smaller.
- going would be good. He's creative about making things out of paper.
- O2 Paper folding. There are some simple folds we could use.
- T1 He uses lots of masking tape and staples. It might be good because he uses lots of large pieces. This would give him some small muscle activity.
- O1 Maybe if he likes large pieces, we should think of a project like making himself, which uses large pieces.

This example appealed to us as extremely significant: on the one hand, a child who is operating from an egocentric view, on the other hand, a child who is already entering the stage of concrete operations. Although it is not explicitly stated in the excerpt, we did share with the teachers our feeling that each child's statement was indicative of his particular level of maturation and appropriate to it; we were especially anxious to be clear that we did not find one statement *better* than the other.

Since, at the time of the workshop discussion, the teachers' interest centered upon the implications for curriculum suggested by the children's statements and not on their implications for child development, our workshop discussions mainly followed this lead. But while we were responsive to their interest in curriculum, it seemed important to us to continue to provide concrete evidence of children's developmental levels in as many different areas as possible.

We reasoned that, by continuing to build a background of observations which would highlight how children were making use of materials and the manner in which they were relating to the activities, the teachers could begin to assess the extent to which the classroom curriculum was matched to the child's interests, needs, and level of understanding. For example, following the discussion about Laurie at the sand table, sieves and assorted containers, including plastic tubes, were placed in the sand area; from the discussion about Curly and the Indian headdress, teachers responded to his interest in making things out of paper and provided paper-folding activities.

Relationship Process to Curriculum

The following selection of examples illustrates how this relationship between observation and curriculum began to develop. In the excerpt below, we were interested in considering how the children were representing objects in their play with Tinker Toys. Kitty and Daniel, in making the simplest possible representational constructions with Tinker Toys, seem to typify the preoperational child's use of materials and actions. The implications for curriculum development seemed quite clear. We agreed that if anything can stand for an airplane, it is unlikely that the child will understand the importance of having a particular shape to represent the letter 'G.'

I'm making a Batman car. Mine's a missile.
I'm going to make a drill out of this--I just made a drill.
That's an airplane.
What makes it an airplane?
It has this and this.

01 *Boats*--the purple stick with an elastic around it and a red stick sticking up was the simplest kind of symbolic representation for 'a boat.' Daniel worked hard on the other boat.

The stick with a point and a green thing sticking up was definitely a rocket...no question about it. ...and then it turned into a drill. The airplane was just two crossed sticks. When I asked her what made an airplane she just indicated the body and wings with her hand.

T2 The exact same case happened to me.

01 The airplane was able to do a lot of things and fly around, so this is something we should think about in relation to what to provide for them. If this is where they're at, we won't expect them to want to make a lot of intricate buildings.

Then there is very clear symbolic representation, so it certainly means they are not ready to do very much with symbols as far as letters and numbers are concerned, and, in fact, if they only go to 3...

02 I noticed yesterday, with Daniel and Karla, that Karla was making something and when Daniel asked what it was, she said, "I don't know yet. I'm not finished."

From our study of the child, we had conceptualized a process that emphasized a relationship between knowing about children and providing curriculum experiences drawn from this knowledge. Our interest is rooted not in curriculum *per se* but in how the content is matched to children's interests and whether the activities offered them as a result are appropriate to their capabilities. The reason we have stressed observation and child development theory is not because they are ends in themselves but because they provide the information from which to build a truly responsive curriculum. Certainly, our observation-based curriculum is an end product of the process, in a sense. However, it is not an end product in the same way that a predesigned or packaged curriculum is a product. It has the potential of being changed as we continue to learn about the children.

As a result of the previous discussion, box collage was introduced as an activity and construction with blocks was given greater emphasis. Also, wet sand was introduced to encourage construction in the sandbox.

As the data below makes clear, the child's readiness for measurement activities and his interest in construction are recognized as areas to explore for curriculum extensions.

November

Bobby is choosing yarn to take home.

B This pink and this

01 The other thing with Bobby was the *longer* stuff. "I need a longer piece," "I'll tie this together so it will be longer," "I want yellow the same size." When I suggested that he match the yellow against the green he did it very neatly. But then he cut them both off. So he ended up with two the same size, but shorter. I

yellow. I'll bring pink and yellow. I need a little longer piece. No, not that one, I'm getting a longer one. I'll tie this together so it will be a longer piece. I want yellow the same size.

- O Why don't you take the pink and yellow and put them next to each other and get them the same length?

Bobby does just that, but then cuts them both shorter.

- O Did you get them the same length?
B Yeh.

think he is ready to get some fun out of simple measuring things.

- T1 He's (Bobby) into construction with blocks.
O2 One thing for Robert and Bobby is the beginning of some measurement stuff with those boxes. Bobby lined a box with a weaving and trimmed it to fit.
T1 He did that another time when he came in with a piece of rugging and he cut it to fit inside the birdhouse he had made.

The framing I was doing uses measuring, but was a little too sophisticated.

- O1 Maybe start by covering the box with paper, and then add the shapes later. How does he (Bobby) plan? Does he draw--does he match?

Curriculum Theme: The Family

It was interesting to note that much of the taped material reaffirmed for the teachers the appropriateness of their classroom curriculum. For example, the teachers had provided a housekeeping area within the room. They were aware of the children's need and interest in exploring and representing the range of experiences and relationships which constituted their home and family environment. The teachers were aware that these themes were central to the children's lives and were constantly being enacted in much of the dramatic play throughout the room. The family theme became a 'unit of study' for the year. Children had drawn pictures of their family early in the year and these were laminated and displayed.

The taped observations, then, became an important source of information through which the teachers could begin to understand individual children's relationships and feelings related to his home and family. The following excerpts typify these points:

Example A

Catherine puts two blocks together, one flat and a thin one upright. David watches her.

- C Here's a bed.
D Know what it looks like to me? A chair!
C That ain't no chair!

O illustrates difference by using blocks of appropriate proportions for a chair.

- O1 It was clear on tape III, with Catherine, that what she was really interested in was the whole family business. She had the mother and father and the man and the girl in bed, etc.
T1 In fact, today she came up to me and said: "I want to do a picture of my family." And I know she hadn't seen the book I had made for her that said, "Catherine's family." I had been waiting to introduce it, but I made it because of the observation.

- O What's the difference between a bed and a chair?
- C A chair has a little thing and a bed is long. *(She puts two figures in the bed.)* So the man will sleep and the girl will sleep.... Here's a man. This is an elephant. Two girls: Here's the little one and here's the mother. Here's the brother. Here's the father and then choo-choo train.

Example B

- C I'm 4 years old.
- D I'm 5 years old. I'm a month older than you.
- C I'm 4.
- D I got 2 brothers-- one's 19 and one's 21. I got 4 big sisters, 5 big sisters-- one littler.
- O Anyone littler than you?
- D Ya, just me. My niece and my baby.
- O2 This morning, I asked him (David) how many in his family. He wasn't sure but I think he knew.
- T1 We were making that family graph of how many in my family, and he said 12 right away, and then we made a list and there were 12.
- O1 And he was clear about his nephew and his niece and the niece was the only one who was younger than he was.
- T1 And he knew all the ages, even his mother's.

Curriculum Theme: Rhythms and Sounds

We have seen from what teachers say and what they are concerned about in the workshop discussions that, as curriculum makers, they are trying to build and structure much of the day's activities around the children's interests and curiosity. They take the children's explorations and understandings seriously, and attempt to provide extensions from these experiences. The theme *Rhythms and Sounds* emerged in this way and became a part of the core curriculum through February. The following excerpt (taped in November) illustrates the teachers' identification of the theme, and the beginning stages of planning for it, which included the incorporation of rhythm instruments that was child-initiated:

- Karla and Lisa are talking.*
- K Green, green, yellow, 1, 2, 3, 4. Green, green, bright, bright, fly a kite.
- L Green, green, kill a queen, sitting on a
- O1 The first time Karla comes in, "You want red?" "No green, green, green" and she carried on that little verse for four or five minutes. And she gets into "Bright, bright, fly a kite" from "Green, green."
- T2 I hadn't really noticed this before. I haven't really heard her doing a lot of this before. Have you?
- T1 Yes.
- T1 We're getting into rhyming since we noticed all the jingles through the tape. We started one long rhyming

- jelly bean. (to Karla) You want red?
- K No green, green, green,
kill a queen. Green,
green, kill a queen,
save a kiss for Halloween. (*The other children join in.*)
- poem which the kids all picked up very quickly and we are talking about extensions of that poem. They extended it by Douglas's adding rhythm with an instrument to keep the beat. He started by hitting the tambourine with his hand and then Karen added a stick and got a whole new sound.
- O1 Are there any particular children to watch in this?
- T1 Karen has trouble keeping the rhythm but her saying of the poem is pretty rhythmical. I notice it more in terms of pacing when she's in a group.
- O1 Karla we will want to watch.
- T1 We decided that instead of reading the poem she (Karla) will be the one to use the instrument to keep the beat.

So far, the material we have discussed is drawn from the period between November 21, when we made the first of three tapes, and December 9, when the second workshop took place. In retrospect, compressing three observations and two workshops into a three-week period was probably less than ideal, and would hardly have been possible if it had not been for the high level of interest generated by the material. We kept to this tight schedule because we felt it to be important to collect and discuss enough data so that the teachers had a real sense of the process before the Christmas recess. Possibly we gained momentum by this concentrated effort at the beginning, but it did put a heavy burden on us and on the teachers, which could have been avoided had we been able to start in October. Given the reality of this time constraint, however, the effort to carry the process past the beginning stages before the Christmas recess was well worthwhile. The schedule gave the teachers time in which to reflect on the material before we resumed our sessions in January.

The Process: Point of Focus

Early in January, we made our fourth observation tape. The workshop session following this observation focused much less on the literal content of children's recorded statements than had been the case in our earlier sessions and was more concerned with the implications of these statements for shaping teaching strategies and choosing curriculum. The shift in emphasis was initiated by the teacher, as is illustrated from the following comment:

- T1 I went through the notes for our last workshop during vacation and picked out just a few things that I thought I would try to look for in the coming weeks. One came out the other day when Curly and Corrine worked together in the block area. We had been talking about friendship groups that Curly might form and he has formed one with Steve. And then the other day when he formed one with Corrine I thought to myself that this might be something to work on. But the information we had gathered was so overwhelming to me that I thought I would just focus on a few points that we had talked about because we really have a wealth of information, but it's too much for me to think about right now unless I take it bit by bit.
- O The things you picked out might be a good place to start.
- T1 One was the friendship group with Curly. The other was that I was interested in that rhyming pattern we had found with Karla and Ralph and a few of the other kids, and I've been thinking about possibilities of what we can do with that, but I haven't started anything concrete in the class.
- T2 In a sense you have though, a long time ago, with Brown Bear. And then the music teacher coincidentally started doing something with rhythm and sounds of words. And you were doing something at a meeting.
- T1 Polly had a Dolly.
- T2 Yes. Jingles.
- T1 I guess I was thinking more particularly of working with individual kids on chants. Did you say you have a book on jumprope rhymes?

The change in the character of the workshop sessions was significant to us because it seemed to indicate that teacher participation had moved beyond the 'consciousness-

raising' stage of systematically listening to, recording, and valuing children's talk and into a more active phase of considering the deeper significance of the material for its potential to guide their teaching.

The topics for the January workshop discussion were selected by the teacher and were limited by her choice to two specific areas:

- 1) *Record-Keeping*: to reveal friendship groups and children's choices of activities;
- 2) *Curriculum*: extensions of the theme of rhythms and sounds.

Record-Keeping

Although this topic is discussed in a separate section, it seems important to the present discussion to note that, up to this time, the initiative for expanding the data we recorded about the children had come from us. At this time, we found the teachers beginning to observe and share in the recording of the existing and emerging friendship patterns and the particular interests of each child. We attribute the teachers' increased interest in recording this information to the fact that they were beginning to find that it had a real relation to their planning.

Curriculum

In January and February, the curriculum theme of *Rhythms and Sounds*, which had been initiated in November (see page 21), was being expanded within the classroom. Having taken their lead from the jingles and rhyming language found on the tapes and introduced rhymes and finger plays as a meeting time activity, the teachers were now exploring other ways to extend the theme and were requesting support materials. (Two books that we provided were "Let's Do Finger Plays" by Marion Grayson and "Poems for Branching Off," an anthology of poems.)

In the February workshop discussion there was a continued change in emphasis toward fewer topics considered in greater depth. It was evident that the teachers were using information they had collected about friendship groupings and children's expressed interests as a guide in planning their curriculum. Also, our analysis revealed both more concentrated discussions about curriculum for individual children and a consideration of the broader possibilities of this curriculum for the classroom as a whole. The following excerpts are illustrative of this point:

Karla: readiness for grouping in number work

Corrine and Karla are building with Lincoln Logs. Karen is watching.

- 01 The other thing I noticed was that there was a good deal of information when they were building. Karla was really thinking in groups and we mentioned that in the last workshop. She talks about how she needs 10

- C I want to do the same thing you're gonna do.
- K Corrine can make it easier, right? Now I've done it better. Look it, Karla's done it. You just put 1, 2, 3, 4, 5, 6--6-- You've got a lot on there--8,9. Is that all?
- K 9 here, 9 here, etc.
- C I'm gonna try that. 1, 2, 3, 4, 5, 6--I need more--7, 8--I don't have any more
- O How many more do you need, Karla? How many in each pile?
- K 10.
- O Do you know how many you need now to finish it? 6 tens?
- K I need these two and these. (*Pointing to places for new towers*) I need 10 for each pile.
- here and 10 here, whereas Corrine says, "I'm going to try 1-2-3-4-5-6--I need more--7-8--don't have any more" and another place she says "1-2-3-4-5-6--you've got a lot there." The counting is quite different between those two children.
- T1 In fact, Joe mentioned last week that Karla was really ready to get into groups and counting by 10s and the 10 place value.
- O1 And by other things--by 5s.
- O2 I've watched her with the Unifex cubes and she was arranging them in groups of 10 and doing some addition--43 and 3 or 43 and 6--and she would recognize a group of 10, but then she would say 10, and say 11-12-13-14, and count the rest up to 40.
- T1 From 10.
- O2 From 10 on. She never got the next 10.
- O1 That was in the tape, too. I tried to push it, but she said "10 and 10 and 10" and I said "6 10s" but she said "one here, and one here, and one here." But I think she's set to get into it.
- T2 Would it help if you labelled it? Just so she could see it visually.
- T1 I think once she gets the idea--but we haven't really gone over it much.

In response to this observation, Unifex cubes and 100 boards were introduced as appropriate materials for Karla. In relation to the math curriculum for the classroom, we suspect that the use of the materials was extended to other children also, but we have no evidence about if and how this occurred.

Bobby: extensions from his interest in measurement and in sand.

Observers have provided small ceramic tiles that are being used in the sand box and also on children's maps drawn on paper.

- O2 Did you notice Bobby's sandbox work, using the tiles for roads?
- T1 Is that the way it is now with the roads in it? He said Joe wants to take a picture of it, so don't mess it up.
- O2 The wet sand allowed him to build a whole network of roads and tunnels.
- T2 Who was with him?...I think it was...
- T1 It should be written down. (This refers to records teachers are keeping of children's elective choices.)
- O1 A logical extension to this--after a while--will be to use the tiles to figure out which road is longer or wider (for measuring).

Curly: construction activities to support measurement.

Origami had been introduced in the classroom as an activity that might involve Curly.

The teachers recognized that the origami paper-folding was not successful for Curly. During the workshops, we explored other kinds of activities which would support measurement and be appropriate to Curly's particular interests and abilities.

- T1 About paper-folding--origami stuff--Curly had a horrible time, but Robert loved it. We made a cup today, and after we had made it once, Robert made it by himself the second time; but Curly just had a really hard time getting the corners to meet other corners.
- T2 Coordination?
- T1 Coordination and just laying the paper in front of him in the direction that the rest of us were putting it in front of us.
- T1 It was kind of ironic, because it was on account of Curly that we were doing this; he seemed to love folding paper. But as soon as we made it into this activity, he couldn't do it. But Robert just loved it.
- 01 I remember that when we talked about Curly and paper, we talked about the fact that he liked large things and really didn't like the small fussy things. So maybe our observations were accurate. I remember that we thought about the idea of him making himself the way the kids were doing the other day--something with big pieces of paper because if that's what he's able to handle and what he likes that it might be...
- T1 Maybe a big cup!
- 02 A giant cup. He might like that. One of the *Curious George* books has a paper hat, which is larger, that you make out of newspaper.
- 01 The other thing they can do is to build with folded newspaper. There is a book about that called *Structures*.
- T1 That would fit in with our paper stuff, too.
- 01 That's really nice for big stuff. They can make great big towers and dinosaurs with rolled newspaper and masking tape. They can build with soda straws and pins, too.
- 02 They roll up the newspaper like tubes.
- T1 That's why I put the newspaper there. I thought someone would make the tubes out of newspaper, but no one did.
- 01 I brought some straws and we could try it, if you have some pins, but we really need two separate sizes. I brought these for "Sounds."
- T1 We have some straws.
- 01 They fit the straws into each other and then pin them, but maybe these children can't do that.
- 02 What we used was plasticine.
- T1 And they used them like a construction set.
- 01 Yes, but straws are nicer than, say, tooth picks because you can make big things.

Curriculum initiated from the observations of individual children branched out into several classroom themes, the two main ones being *The Family* and *Rhymes, Rhythms, and Sound*. During January and February, these themes were specifically and consciously extended by the introduction of related activities and interest centers.

Curriculum Around Sound. The teachers set up an area in the room for children to experiment with making sounds. The children, as observed by the teachers and workshop leaders, were keenly interested. From a developmental point of view, the theme was appropriate to the age group. As Bussis has pointed out, "before a child can comprehend spoken language he must be able to discriminate sounds and pay attention to them."*

*Bussis, *Let's Look at First Graders*, op. cit.

The following discussions indicate how the teachers were relating sound activities to their curriculum:

- O2 The thing which interested me was your notion of taking things associated with sound like 'loud' and 'soft' and trying to structure ideas related to loudness and softness.
- T1 I thought it would be good to work on those concepts; what we have done so far is to have a place where there is all different kinds of paper and see the different ways that one kind of paper can be made to sound loud and soft, and the differences with different materials.
- O2 What they have been doing is seeing the different kinds of sounds they get from stroking the different kinds of paper--ruffled paper, sand paper, tissue paper...
- T2 And with strings (rubber bands) added to it. Karen made an instrument and she figured out 5 different ways to make sounds. She had a one-man band.
- T1 Karen has always been into sounds. We talked about loud and soft and high and low.

Another 'sound' activity seems to have been initiated by the children themselves. Plastic tubes had been placed in the sand area with which to explore volume. The children had been using these tubes to make sounds:

- O1 Have they done something with the tubes and making sounds? We generated the idea because I thought they had been experimenting with the tubes.
- T1 (to assistant teacher) Yes, at a meeting you had them playing the tubes. They were blowing through them and seeing the differences in sound.
- O1 How did they make the sounds?
- T2 By blowing through the end like a trumpet. And they discovered it themselves.
- T2 We changed sizes (of the tubes) and tried the really large size and they couldn't get a sound out of it because the mouth piece was larger than their mouths.
- T1 And did they get that?
- T2 I don't know if they got it. I have a feeling they may have gotten it but couldn't articulate it.
- O2 One of the kids did say "our mouths are too small."
- O1 And that's the same as the kid who said "my head is too small" for the head band.

This is the first evidence that we found where the teachers seemed to have recognized the significance of children's statements as an indication of their stage of development. The teachers had acknowledged the similarity between the point of view implied by the two statements: "my head is too small" and "our mouths are too small." The larger significance for us was the indication that the teachers were beginning to internalize a different way of thinking about the children. Their observations were influenced by a frame of reference which included developmental considerations.

INTERNALIZATION: A CURRICULUM WORKSHOP

As part of our February conferencing, we planned for a curriculum workshop around the E.S.S. unit, *Whistles and Strings*. We felt that it was part of our responsibility as staff developers to act as a resource of curriculum ideas for the teachers. The initiative the teachers had already taken in introducing activities related to sound indicated that they would be interested in exploring curriculum ideas in broad terms, as well as in focusing on curriculum for individual children.

A section from the transcript of this workshop is included to further illustrate a change toward internalization through the quality of the teachers' participation in the staff development process. The lively interaction with materials and among the group, which characterized this workshop, can be represented on paper only meagerly. But the excerpt conveys the enthusiasm with which the teachers entered into the activity and the quality of the interaction between staff developers and the teachers:

- O1 I brought some straws for making sounds; you have to cut them.
T1 And you actually cut a piece out of it?
O1 No, I cut the two sides. It is like a reed for a wind instrument; you can make all sorts of sounds when you learn to control it.
T2 All you have to do is to cut each side at an angle?
O2 You might have to flatten it first.
O1 This is too long; you'll have to cut it; you'll never get a noise out of it when it's that long.
T1 Does it take a lot of wind?
O2 Not too much. You have to bite it--about here--and then experiment. You chew it.
T2 You blow at the same time you bite it?
O1 You can change the pitch by cutting it. It has one basic tone.
T1 Oh, that's *great*! You can feel the vibrations all through your mouth. That's really great. Are you going to leave the straws with us? Oh boy! It tickles! And cutting it should make it higher--right?
T2 Is the tape recorder on? (roars of laughter)
O2 Have you ever blown through a Chiclet box?
T1 Oh yeah! We used to do that. We used to do it with a

raisin box. We used to put the whole box in our mouths and blow. It made a really neat sound. And a Coke bottle makes a beautiful sound.

We find it significant that ideas for implementing the material into the classroom were not an issue during the workshop; the whole emphasis was on exploring the potential of the material. The theme was suggested by the taped material, but the teachers were not asking, "How do I do this with the children?" but rather choosing to experiment with the material themselves--at an adult level. We see this as evidence of the teachers' confidence in their own ability to implement the curriculum ideas drawn from the workshop. Additionally, there was a change toward more equal participation in the discussion between the teachers and ourselves--another indication that teacher participation was beginning to be based on their own convictions. In other words, it is reasonable to conclude that the teachers were beginning to internalize the ideas and experiences which had grown out of the workshops.

CONSOLIDATION AND INTEGRATION

The increased breadth of workshop discussions with its focus upon observation of individual children and adaptations of curriculum to meet their needs, which we see beginning to develop in February, expanded during the remainder of the year. In May, we found evidence that teachers could see how the accumulating information about their children had a real relationship to their planning for the class; a workshop discussion was devoted to what we knew about each child and to planning for "directed observations" to expand this information base.

Workshop discussions at this point included the teachers' own observations and the taped material was addressed in terms of its meaning in a broad way against the background of what the teacher already knew about the children. This change, together with the teachers' requests for directed observations of particular children, indicated a 'higher level' of participation in the process. The teachers' expectations for the children at this point were based on an awareness of their level of concept development as revealed by their actions and conversation.

May

- 02 What we thought we might do today is to make some assessment of where we are...and what we might do between now and the end of the year to pull some of the pieces together. We'll try to exchange some ideas in ways that make sense to you.
- 01 On Douglas, in the earlier tapes, we have some developmental stuff on the way he was working and the things he was saying and not saying.
- T1 That was back in November; it might be interesting to see where he is now.
- 01 It might be interesting with Daniel, Douglas, and

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Kathleen. We want to know whether they are still relating to each other in the same way, using equipment as representational, carrying on the same kind of conversation and where they are, conceptually, about number.

- O1 With the STAR test*, can we supplement rather than duplicate what you will get from that...
- T1 I found it (STAR test) a little bit helpful in the beginning of the year....but once you get the kids into the classroom and interacting with other kids, it really doesn't tell very much at all.
- T1 Jeff and Bengy are both strong in terms of readiness--they like to read and write stories. Jeff has been a hard kid to get to know.
- T1 (plan for Monday) Shall we include Jeff in this group? And Kathleen would be interesting; I would like to continue with her.
- T1 Clay would be a good place. I don't know if it's structured enough, but they do a lot of talking around clay. This morning the conversation around clay was fantastic.
- T1 For planning--I need to go through notes. Then I can jot down the kids we need more information on, and think of some groupings we could set up including those kids. In terms of extensions--we have a lot of things we planned that we haven't gotten into yet. I would like to get more information, particularly on some of the younger kids.
- O2 I see us moving away from curriculum planning and more into trying to tie up what we know about the kids.
- T1 In talking to next year's teachers, it will be helpful, and also for end of the year reports.
- O2 Tapes represent only one aspect of what we know. We know a lot more--we have pictures and collections of kids' work which we should review.

The method the teacher chose to find out more about her children seems particularly significant to us. She has rejected our suggestion for analysis of the STAR test in favor of observation and recording of the children's conversation during an activity. Moreover, she has selected the activity (clay table) based on her own observations that clay is an activity which encourages conversations likely to give insight to children's thinking. We concluded from this evidence that the teacher was placing a real value on learning more about the children and had become convinced that observation, including paying attention to what the children are saying, provides more valid and useful information than children's test responses.

The discussion during our final workshop session of the observation around the clay table indicated a new beginning stage of looking at children. Up to this time, as workshop leaders, we had constantly alluded to developmen-

tal considerations, but we had been unclear about the significance of these considerations for the teachers. Now we felt that teachers were asking for this kind of information. It seemed appropriate, therefore, to discuss the taped material from a developmental point of view. Although the teacher's statements during the discussion were minimal and mostly confined to expressions of agreement (not transcribed), her concentration and her excitement about the material indicated to us that she was observing and thinking about her children in a new way. (Note: The assistant teacher was unable to attend the last two workshops. However, she continued to demonstrate her interest by reading the conversation and workshop tapes and discussing the material with staff developers during the school day.) The topic content of the workshop represented a reconsideration of children particularized to include a perspective drawn from developmental theory and with a strong focus on children's understanding of mathematical concepts.

The topics fell into two general categories:

- 1) *Mathematical and logical concepts*: Relationships of age, time, size; conservation of volume and length; conservation of number; one-to-one correspondence.
- 2) *Language development*: "How children are talking;" communication; more abstract use of language.

We are including major sections from the observation around the clay table tape, in its sequential order, for the sense it provides of the flow of the children's conversation and for comparison with the first recorded conversation tape which was made in November. The workshop discussion of the taped conversation is also included as it actually occurred, instead of being organized according to topics discussed. Since the relationship between the conversations and the discussion is quite obvious, it seemed unnecessary to interrupt the sequence with commentary and more helpful to an understanding of the process.

*Conversation among
Bengy, Kathleen, Jeff,
and Ralph.*

- K I'm 5. You know what, I'll be 6.
 K I was 5 before you. Now I'm both 5, right?
 B I'm older than you 'cause I was 5 before you.
 K I'm 5 before you, so I'll be 6 before you. And I'll be 6 and then he'll be 7. And then I'll be 7 and he'll be 8 and then I'll be 8--just like my sister, she'll be 8.
 R I'll be 9 when you're 8. I'll always be older.
 K Then I'll be 9 and you'll be 10 years old.
- K I could make this skinny, right? What you got, Joey?
 J I'm making a snake.
 K Maybe I'll make a snake.
 B I'm making a snake, too.
 O What makes a cobra look different from any other snake?

Ralph described cobra head, but tape inaudible.

R I went to a zoo. I saw this guy with a snake around his neck.
O Was it a cobra?
R No, it was a rattlesnake.
J So what. I went to the Museum of Science and I saw a snake.
K I went on a high plane. I saw a big alligator. It's not real, it's fake.
R How did you catch it?
K He stared at me and I picked it up.
B How did you think it was fake?
K I put the penny in the alligator's mouth and it went down the throat.
B Do you still have it? Some day you can bring it in.
J Look at how much I got already.
R How did you do that so fast?
J I started before you, Ralph.
O Bengy, you got your snake done?
B Yup.
R Mine's almost done.
B I was done before everyone.
O Yours isn't as long as Jeff's, though.
J Look at all the colors in mine.
R It looks like a rainbow.
J I like the green. Doesn't that look like a green snake?
K I like this kind of green because it looks like an alligator.
O An alligator?
K Yah. That's what I was talking about.

O Who do you think has the most clay?
R I do. I'm making mine real skinny.
K I'll cut that snake's head off.
B No, Kathleen. Cut his head off. Off with his head. I'm not done yet.
K Mine's getting long.
R Mine's longer than yours.
J Mine is too.
R Mine is longer than Kathleen's, so mine is longer than yours.
J Mine is longer than yours, Ralph.
R Almost the same.
K Yah, but you cut off his head.
J If I put the piece back on then it will be the same size.
K It will be bigger--way, way bigger. See, here, like that.
O Ralph, do you think yours is longer than Jeff's?
R Wow, yours is getting longer.

O Whose is longer?
R I think mine is.

J Yours is right there and mine is all the way down to there.
 O Do you think yours is longer, Jeff?
 J I'm going to make mine bigger.
 O I'm not sure, we'll have to see whether it is or not. Try it and see. You have to attach it more.
 J I got an idea. Why don't we attach it, then we'll have a big snake. It could be a king cobra.
 K It's making a long one.
 O Bengy has a head on his; I think I see something that looks like eyes.
 B We got a giant size.

B This is a king-sized snake. We curl him up.
 J This is the king of the jungle.
 R Uh, uh. Lions are. Yah, lions are the king of the jungle.

Workshop Discussion

O I got a sense of maturity from Ralph, in all conversations; he comes in with things like, "I'll be 9 when you're 8--I'll always be older."
 T1 That was an interesting conversation he was having with Kathleen.
 O1 But Kathleen has got it, too. "I'm 5 before you, so I'll be 6 before you." She has that time concept also.
 O2 And she's generalized it to say "Just like my sister I'll be 8."
 T1 This is typical of most of the kids. But during the interviews with the mothers, Kathleen is the one who says how old was so and so when he was born? She's very concerned about that. About babies and ages of babies.
 O1 She doesn't have the concept that you can have no years.
 T1 That's right! None of the kids do. It's very difficult to explain and it seems to me they're just too young.
 O2 Bengy has it too; he says, "I'm older than you because I was 5 before you."
 O1 I had a feeling these kids really knew about their ages. They weren't using it as they did the numbers on the forks. They associated it with a sequential thing that could be called years.
 O1 These kids were really paying attention, and listening to each other in a very different way from the kids early in the year on the Tinker Toy tape.
 T1 Yah, I sort of thought that might happen.
 O1 They are listening to each other and responding. They were exchanging information.
 T1 It seems that clay is a very social kind of thing for kids to get into.
 O1 They are relating the color to something else that's the same color, which is more sophisticated use of language.
 T1 Yah! It looks *like* a rainbow. It looks *like* an alli-

- gator.
- 01 That's using language in a more abstract way than just labeling things.
- 02 There's also that part that shows they really are listening together. Kathleen says, "I saw a big alligator. It's not real, it's fake." Then they say it looks like an alligator because it's green. Ralph says, "... an alligator?" Kathleen says, "...Yeah, that's what I was talking about."
- 01 The other thing that doesn't come out in the tape was all the measuring that went on.
- T1 Talking about longer and...
- 01 Bengy says, "I was done before everyone." And I said, "Yours isn't as long as Kathleen's." Then he took it up and measured it against the others.
- T1 Ralph didn't explain why he thought he had the most clay. You said, "Who do you think has the most clay," and Ralph says, "I do."
- 01 He does have the most clay. His was much fatter and then he says, "I am making mine real skinny," and what he's telling us is that he knows that, because his was fat and he was making it "real skinny," it was going to end up longer.
- 02 On the time sequence, Ralph asks "how did you do that so fast?" Jeff says, "I started before you."
- 01 And Jeff says, "If I put the piece back on, then it will be the same size."
- 02 It's interesting that their association with size is related to king. They talk about--a big snake and name it King Cobra--and they talk about...
- T1 A "king-sized snake." Then they get into the play on words and talk about the king of the jungle.
- 02 We were impressed with Ralph's deductive logical reasoning. "If mine is longer than yours..."; he goes through the reasoning process about whose is longer. Mine is longer than yours. Ralph says, "Mine is longer than Kathleen's so mine is longer than yours." He's sure of that in the same way he's sure about the ages-- "I'll always be older."
- 02 This is an impressive tape.
- T1 Yah, it is.
- 02 To hear it is incredible.
- T1 Did you bring it? It's really the first one where children have been listening to each other and responding.
- 01 It's a big difference from the beginning of the year.
- 02 And Kathleen, who we thought might not be incorporated into the group, was pretty much accepted.
- T1 And I was surprised that she contributed so much. She did a lot of talking and responding.

The teacher's participation in the discussions is at a very different level in this workshop than in our earlier

sessions. She is now following the discussions and entering into them both at the theoretical level and by providing observations of her own. Her assessments of how children are talking and of their mathematical thinking in June as compared to November are now related to maturation and concept development. For example, the children's misuse of numbers in November (see page 14) was attributed to egocentricity or grammatical error. In this discussion, the children's understanding of how numerals describe their age in terms of years and of 'older' and 'younger' is recognized in terms of concept development and maturation. The teacher is also probing the level at which children understand the concept of age by noting Kathleen's question to the mothers--"How old was he when he was born?" Similarly, in the area of language, the teacher is aware of the change in the children's conversation from parallel to interactive and even indicates that she expected this might happen. She has also provided the example of more abstract use of language from the tape. The teacher's orientation is further confirmed by her request for the staff developer's assistance, through observation, to assess individual children's levels of concept development.

At the end of the workshop, we planned together for observations to assess one-to-one correspondence, conservation of number, and concepts of classification. Part of that discussion is included below:

- 02 In terms of classification, there are two things we might do. There is a high interest in animals in this room with the cards and the lotto games. Mostly color is what they look for.
- T1 That's what they talked about--Chico the parrot. His head is orange and yellow and green.
- 02 The other is the interest in the family and family charts.
- T1 How would you do that?
- 01 The math material from *Let's Look at First Graders*, on logical classification; a child includes and counts himself in the total pool. If he has three brothers and you ask him how many boys in the family, does he say 3 or 4?
- 02 There is some one-to-one material also. If you want a lollipop for each member of the family, how many would you need. So here you find out if he is including himself. And does the child understand he is a brother or sister to his own siblings?
- T1 When I was doing the family chart with Steve, he said, "this is my mother," etc., and then he said, "This is David--Steve's brother--" and, I think at one time, he said, "This is Steve, David's brother."
- 02 I can begin with one-to-one correspondence, using the family charts.
- T1 That would be really helpful.
- T1 Kitty will repeat K. It will be interesting to know what she will do with classification. Also the other young kids that we don't have much on--Rita, Douglas,

- and Artie--can you work with four, with the animals?
- O1 Two at a time is probably better.
- T1 Artie and Douglas--Kitty and Rita.
- O2 Rita might be intimidated by Kitty.
- T1 Maybe Artie and Rita because Kitty is all right with Douglas. She's sort of "mothering" to him. That would be helpful to me.

SUMMARY

In reviewing the year's work, we can identify ways in which the process we have been engaged in have been responsive to the developmental needs of the teacher. The teacher is now thinking about children differently than she did at the beginning of the year. Her observations are more specific and include consideration of the child's point of view. She has recognized the value of the taped material for deepening her understanding, but she is now going beyond it by gathering her own information from many sources: observation, listening, and collecting children's work samples. She has, in fact, become independent of our original process at this point and is moving ahead on her own. She is now requesting assistance from us in obtaining observations which are planned to provide evidence of children's levels of concept development. With this new level of awareness, adjustments in the process will be necessary during the balance of the year and for our work with this teacher in the coming year.

The pattern of staff development that we see emerging from our own data can be conceived of in the following way:

Beginnings. The beginning was the recorded conversations that teachers found interesting and that stimulated discussion. Their participation was directly focused upon and limited to the transcribed material. As the material was reflected upon, the teachers began connecting the information with practice and developing curriculum themes. Many general topics and issues were generated.

Point of Focus. At midyear, the teachers began to express the need to focus upon more specific and limited information. It was our feeling that their increased awareness of the implications of the information led to the shift in this direction. What seemed to underlie this shift was a concern for knowing more about the individual children in order to plan appropriately for them--which is not to say, in any way, that they had not attempted to do this previously. However, the content of the recorded conversations and the workshop sessions related to these conversations seemed to provide a systematic and organic process to facilitate observations and recording. The process seemed to give the teachers a "second look at" their children--a look at things they missed because of the immediate and heavy demands of the teaching day.

Internalization. The teachers have entered into the reflective process at another level. Their participation in a workshop on the theme, *Whistles and Strings*, was an exploration of the possibilities of the material for its own sake and was not specifically related to the use that could be made of it in the classroom. It is evident that teachers valued the potential of the material to promote their classroom objectives of active learning for children and were not in need of suggestions for classroom adaptation.

Consolidation and Integration. From the perspective of staff developers the teachers are now drawing upon their own internal structures. They are beginning to approach the material in ways that illustrate to us an interplay between knowing about and planning for individual children and developmental theory.

The material for the discussions is now drawn from a broad base of teachers' own observations and interpretations. Specifically, the taped conversations is only one of the several resources used. Workshop discussions represent more of a team approach.

Staff development support for the teachers at the end of the year has shifted its focus to requests for observations planned to gather information about specific children's developmental level and concept formation.

Differentiation of Teacher Perception

In the previous section, we have given a general picture of the pattern of the staff development process over the year. In this section, we wish to illustrate in more detail changes in teacher perceptions in relation to the child as an individual. Some data from the previous section is repeated where it seems helpful for developing the sequence. We've also highlighted, in italics, the points of interest we picked up on.

THE CHILD AS AN INDIVIDUAL

We have selected data about a kindergarten child, Kathleen, and a first-grade child, Steve, who was with the same teacher for his kindergarten year, to illustrate the differentiation we see in a teacher's perceptions of individual children over the period of the study. The teacher's concern about Kathleen is centered around her social development. Her concern about Steve is focused on his academic development, especially his difficulty in learning to read. In both cases, the teacher's observations of the child become more specific as they are related to an increased understanding of child development. In the case of Kathleen, the teacher has recognized her need for more information and has planned for additional observations in late spring. The information about Steve tends to be specific to his learning problems. However, within the context of this concern, the teacher has also expressed her realization that she needs to know more about the child's interests and strengths. We find it significant that, although Steve was with the teacher the previous year, information about him as a kindergarten child has not been part of our discussions.

The information about Steve is much more complete than the data about Kathleen. We did not anticipate that a full profile of each child would be generated through the workshop discussions. Rather, we anticipated that such profiles would develop later, through teachers' records, as a consequence of their increased understanding and knowledge of the children.

November/Kathleen

*Kathleen and Rosie sift-
ing sand and humming*

01 You have all the things that Piaget talks about as pre-operational; monologue. . . the beginning of parallel con-

monologues, "30-40-40"...
"everywhere you go, people want to know where we live..."

You live at Chestnut Park.

No, I live on Plympton Street.

I know where you live.
Bobby knows where I live.
So what? I know where you live, right?

No, she doesn't.
I live in Cambridge, and
I live in a grey house,
and I live upstairs.
You live in a different house than you lived last year.

I live in the same house with you and I live with you--right?
The same door.

Hey, she lives in the same door as me.

Uh, uh, I live in Cambridge.

versation and a little bit of children talking together about something, but not much. There's a lot of almost babbling also, which is almost 2-3-year-old stage--so probably a lot of these children are somewhat immature in some way.

O points out that children are not really oriented in space, so we wouldn't expect them to do activities like mapping. T2 feels that what children need is to have experience outside their neighborhood. The workshop leaders are also questioning the child's concept of sequential time.

The staff developer is relating the child's confusion about location in space to an early developmental level; the teacher feels it is due to lack of experience. The teachers give no indication of how they feel about the child's understanding of sequential time.

T1 Kathleen was really getting into puzzles that day. She got a big group around her...

T2 I tried to get her to, for example, look for pieces of the dog, and she found that hard...

T1 Her approach to everything seems to be lack...of thought--She's young--she needs discovery of what things are.

T2 Even in terms of the room. She doesn't have a sense of the whole room yet, or at a meeting--what's going on.

Teachers have characterized Kathleen as "young" and "needing discovery of what things are."

During workshop discussion, teacher requested observation of Kathleen:

January

T1 ...We're interested in her effect on other kids. She has hair all over the place and a funny voice--a deep voice; she's a whiner. Lately, she's been bugging kids at meeting and at lunch. No one wants to sit with her. She's constantly complaining about other children. I would be curious to watch her movements

during a time period in the morning.

The child is described in terms of appearance and behavior. Teacher interest seems focused upon the effect the child is having on other children. There is no reference to any specific information known about the child. However, a need for more information is recognized.

May

Kathleen, Bengy, and Ralph at the clay table.

- I'm 5. You know what,
I'll be 6.
I was 5 before you. Now
I'm both 5, right?
I'm older than you 'cause
I was 5 before you.
I'm 5 before you, so I'll
be 6 before you. And
I'll be 6 and then
he'll be 7. And then
I'll be 7 and he'll
be 8 and then I'll
be 8--just like my
sister, she'll be 8.
- I went on a high plane.
I saw a big, long al-
ligator. It's not
real, it's fake.
How did you catch it?
He stared at me and I
picked it up.
How did you think it was
fake?
I put the penny in the
alligator's mouth and
it went down the
throat.
Do you still have it,
Kathleen? Some day
you can bring it in.
- T1 That was a really interesting conversation he was hav-
ing with Kathleen.
O1 Kathleen has got it, too: "I'm 5 before you, so I'll
be 6 before you." She has that time concept also.
O2 And she's generalized it because she says "just like
my sister, I'll be 8."
T1 During the interviews with the mothers, she's the one
who says how old was so and so when he was born? She's
very concerned about that; about babies and ages of ba-
bies.
O1 She doesn't have the concept that you can have no
years.
T1 That's right. None of the kids do. It's difficult to
explain. It seems to me they're just too young.
T1 This topic is really the first one when the children
are listening to each other and responding.
O1 It's a big difference from the beginning of the year.
O2 And Kathleen, who we thought might not be incorporated
into the group, was pretty much accepted.
T1 And I was surprised that she contributed so much. She
did a lot of talking and responding.

*Kathleen is described by the teacher both in terms of her understanding of years old and her participation in an activity. The quality of communication is also recog-
nized.*

*It is evident that the teacher has related the child's understanding to conceptual development. She also seems aware of a sequential dimension to the concept. The child has demonstrated her understanding of age relation-
ship, of 'older' and 'younger', but is in a transitional stage in understanding the more confusing notion that your birth
date is the zero point which determines your age.*

November/Steve

*Terry and Lisa, two old-
er children from other*

- T1 I really felt sorry for Steve. He was just kind of...

*classrooms, were teaching T2
Curly, Robert, Karla, and
Steve how to do weaving
with soda straws. All
were sitting around the
table. Terry and Lisa
were helping Curly and T1
Karla. Others (Steve and O1
Robert) were waiting for
help.*

S Hey that was mine--
blue, orange, red,
and pink--and give me
the scissors and...

C Hey Steve, stop cut-
ting and give me the
scissors and don't
touch.

R I can't do mine.

L What color you want--
this one?

S Yeh, yeh, I got red
now.

*Fifteen minutes later,
Steve still hasn't gotten
started. Steve moves o-
ver to Terry, who helps
him.*

T (to Steve) What color
you want?

S Red...Can I cut these
up in pieces, could I,
could I?

*Steve cuts up straws and
yarn into little pieces
while waiting for help.*

S I don't want to do it
no more.

O You haven't tried it.

T You cut up the straws
--you're going to
clean up the mess.

S But I don't know how
to do it.

T That's too big for
his head.

*Terry measures yarn
around Steve's head.*

T There's no more straws
for him. Here's one,

He was really very patient. He was at the table and
really says nothing except right at the beginning,
and it seems he was very frustrated just watching ev-
erybody doing it and decides to cut up pieces of
straws and just looking for something to do, and de-
cides to do that.

T1 I think Steve got frustrated and gave up.

O1 He obviously was using the scissors because Curly
says, "Hey, Steve, stop cutting and give me the scis-
sors." He's cutting things up for a while. Where
does he come in again? Ten minutes or so along the
tape, which maybe is quite a long time.

T1 It is, for someone to kind of just sit and wait for
help.

O2 But you know he's consistent. Lisa says, "What color
you want--this one?" "Yeah, I got red now." And
earlier Terry said to Steve, "What color you want."
And Steve said, "red." In all that time, he still
decided that red is what he's going to work with.

T1 One thing it might tell us is that there were too
many kids there for the two older kids to handle at
one time.

here's one..."

- O That's too short, but
here's one that will do.
S I don't want to do it
because I can't do it.

The teacher's analysis of Steve from the material is limited to a description of his being frustrated and patient. There is no probing in the discussion to try to understand why he was frustrated (i.e., was the task too difficult?). There is no reference made to what could be learned about Steve from the observation.

Observation of Steve working on a puzzle.

He sorted the pieces by designs (one clown had a striped suit), by color (other clowns wore yellow, purple, and brown). Talking to himself: "Stripes go with him. He has the biggest nose. He has a yellow suit. He has a cross on his nose."

- O2 In terms of Steve--it's interesting to see his sense of being able to sustain himself in a puzzle activity in comparison with the weaving. On the puzzle, he could stay with it even though....
T1 He wasn't very successful. (I find that encouraging.) Weaving he had to do with his hands.
O1 The puzzle he has to do with his hands, but it's more visual. If I had 63 pieces I didn't know what to do with--and he didn't know what to do.
T1 But he organized it. He found a way of relating to the puzzle.
O1 Which was different from Kathleen; you said you tried to interest her in the parts of the dog and she didn't respond. What does he stick to and what is he interested in would be things to record about Steve. One way to find out would be what kind of things does he talk about.
T1 He talks a lot about his father.

One of the teacher's concerns about the child is his ability to persevere at a task. At this time, they are paying attention to his manipulative skill and, in a general way, recognizing that he was able to organize the puzzle.

Teacher response to inquiries about the child's interests are limited.

March

(Steve and Curly)

Steve is very specifically talking about a brick wall, just as he talked about the clown's stripes, etc.

- S What's your name?
C Spiderman
S What do you do?
C Fight people.
S I thought you climb up walls.
C I do.
S What kind of
C Any kind of walls.
S How about brick?

- O1 Did he group the puzzle according to the clown's pieces?
O2 Yeah. At first he did it very randomly. Pulled out a piece and put it back if it didn't fit. Then he began to sort them by color. One clown had a striped suit so these pieces go with that clown. One had yellow, purple, and brown. Lots of verbalization--"He has one striped suit--the yellow suit. He has the biggest nose." He's looking at striking details.

C Yeah.
S OK. Goodbye.

- O1 He's conceptualizing the whole thing. We should notice how he does other things to get a sense of his learning style because that will help to crack the reading.
- T1 If someone is highly visual like that, really notices visual details, what's the best approach to reading?
- O1 Well, it's certainly not going to be phonics.
- T1 Oh, no. I dropped that long ago. Word cards go pretty well. He remembers them. We do a lot. But once I start putting them together into a sentence, he seems to get thrown off seeing them in a pattern and seeing them in separate words.
- T1 He can if I make the sentence first: "This is Steve Good." He can pick out the words and put them together. But then if I say, "in those words, which one says Steve," he has a hard time finding it. If I showed him the card that says Steve, he would know it. But when it's in a group...
- O1 Can he pick it out of a group if it isn't in a sentence?

The workshop discussion (not all recorded) took note of the fact that Steve always included visual detail in his statements.

We identified the child as having a strong visual organization, but were unable to make a direct connection between this information and a specific approach in assisting this child in his learning to read. In retrospect, we acknowledge that we also sidestepped the issue. This point serves to illustrate the value of the recorded dialogue in providing feedback to observers.

March

- T1 He spent all day on that clown. I put out different shapes on the paint table and assigned him there. He put together the circle and the triangle for the head and hat and then, all on his own, he made the tie and the body and arms. He finished the body this afternoon. It is the first time he did an all-day project by himself. He was alone at the table almost all morning. This is a great accomplishment for Steve. Mildred may have helped him with the hands and feet but it was his idea.
- T1 Steve did the alphabet out of clay. I had assigned it, but he enjoyed doing it. Steve's kind of a background kid. When you ask me what he's really interested in I find I don't know. I've been very conscious of his learning problems and have been conferring with Marian across the hall. He's not interested in words. I started him on the Steve Good book--all about himself. It's the first time he did some serious drawing and coloring. He knows about isolating a word but seeing it as a whole he has a lot of trouble. I cut out letters and put them underneath and we talked about each word.

- O1 We should watch how he approaches puzzles--Joe has some on that. He may not have an auditory recall.
- T1 They (special needs teacher) are working on left/right organization and sequencing.
- O1 His drawing is marvelous. It shows a strong visual organization.
- T1 When he drew me, he was very conscious of the colors of my patch pants.

The teacher has recognized Steve's ability to persist at a project and complete it as an indication of growth. She is also concerned about finding activities that interest him.

The teacher seems to be acknowledging that she doesn't know as much as she feels she needs to know about the child. She realizes that her focus around his learning to read has limited her observations.

Although the discussion now includes the child's interests, the discussion indicates the central importance of the reading issue. The teacher has talked in detail about her efforts to support the child in learning to read and constantly returns to this question in discussion about Steve.

- O2 This may explain why he's not signing up (for activity choices). Maybe he doesn't understand how to sign up. He doesn't strike me as a "wanderer" like Maria and Karla. Could we pair him up with someone like Curly to help him sign up?
- T1 On the chart, I tell the kids when there's something new, like water, it's the word that starts with a "w" and if you can't find it, ask me or an older kid.
- O1 That might not help Steve if he can't take words apart and think about the first letter and the last letter.
- T1 And he doesn't know what a "w" is anyway.
- O2 He has nice reasoning power. He says to Daniel (who can put the puzzle together), "you must have one of these puzzles at home."

May

Fran is the social worker for the program. She has made several observations of Steve. Steve goes to the special needs teacher (across the hall) for tutoring.

- T1 I was talking to Fran about the possibility of using her reports and getting her to go over them with us.

The teacher is actively searching for additional information about the child. She is aware of the "animal classification" activity even though it took place in another room.

- O2 Steve's classification of animals across the hall was interesting. He put the lion, tiger, and rhinoceros in a cage, and left the alligator and the giraffe, the elephant and cow, and the horse outside. When I asked him about the caged animals, he didn't say wild, he said...
- T1 It was something with a negative connotation. Fero-cious? Dangerous?
- O2 That's right, he said they're the dangerous animals. He even put a top on the cage.

- O1 Did you ever find out if Steve can pick his name out of a bunch of cards?
- T1 Oh yeah, he can. In fact, I'm sort of scared to get excited, but in that book that he's making, we've scrambled all the words around and he knows them and he remembers them even over the weekend. He's really getting it.

She recognizes the child's progress in learning to read. The statement reveals the anxiety that has accompanied the teacher's efforts to assist the child in learning to read. It is worth noting that the child is a first grader who was also with the teacher for his kindergarten year. The data reveals to us that this child is only beginning to reach a stage of maturation where it is possible for him to learn to read. The teacher's anxiety reflects the external pressures for early reading as opposed to considerations of the particular child's readiness.

- O1 I was thinking about that when I went over the summaries. When Kitty--in the first tape--puts the "e" in the wrong place--what I would say now is that maybe she didn't have the idea that the sequencing of letters was important. (T1 agrees.) She hadn't got the point that there was a sequencing of letters that made it into a word and that you could change the sequence around and make it into another word using the same letters. It was more that it was a picture of a word and in the picture it didn't really matter much which way it went.
- T1 Boy, that sequencing is so important.

The discussion concerns the complexity of the reading process. The suggestion, with which we felt the teacher agrees, is that a child with strong visual orientation may have particular problems with sequencing.

(Steve and Curly)

- S What's your name?
- C Spiderman
- S What do you do?
- C Fight people.
- S I thought you climb up walls.
- C I do.
- S What kind of walls?
- C Any kind of walls.
- S How about *brick*?
- C Yeah.
- S OK. Goodbye.
- C On TV I fight people and climb walls, but when I get home I get all my stuff and go to hockey. I play hockey.
- S What kind of hockey?
- O1 If they are highly pictorial, as we were saying about Steve, for instance, that in the television tape when he talked about what kind of a wall--it was a brick wall--very specifically.
- T1 And he asks specific questions, too.
- O2 He's very detail-oriented.
- T1 He's into detail.
- O2 On the TV tape, Steve says, "What's your name?" Curly says, "Spiderman." Steve says, "What do you do?" Curly says, "Fight people." Steve says, "I thought you climb up walls." Curly says, "I do." Steve says, "What kind of walls?" Curly says, "Any kind of walls." Steve says, "How about *brick*?" He wasn't about to accept any kind of walls. He says he fights people and climbs walls, but when he goes home he gets his stuff and goes to hockey. "I play hockey," Curly says. Steve asks him what *kind* of hockey. "Channel 38 hockey." He wasn't satisfied with that. "What team are you on?" "Bobby Orr." "Do you win sometimes?" "Yah."

C Channel 38 hockey.
 S What team are you on?
 C Bobby Orr.
 S Do you win sometimes?
 C Yeah. I always fight the people.
 S How come?
 C Because I like to.
 S Because they knock you down?
 C I knock them down so they can't move and I win.
 S Well, I do hockey too. So, see you later, alligator.

"How come?" That's really true that he pays attention to detail.

T1 Yes. Whenever he makes people, it's always their clothes he's very concerned about. Today he was making the red pants and striped shirt--and one day he was drawing a picture of me and he said, "Now let's see, what do you have on?" And I modeled for him and he did every color in my pants.

The teacher is making the connection between the child's learning style and the reading process. The television tape, made in February, was always fascinating to her. But now she seems to be reexamining the content for what it reveals about the child. She recognized the specific quality of Steve's questions and makes the connection between the quality of his questions on the television tape and his interest in people's clothes--especially the color--when he makes pictures of people.

The discussion relates to the use of children's interest in the family as a basis for directed observations to assess their concept development in the area of logical classification. (Steve's picture of his family, drawn in late spring, is shown on the next page.) Children drew their families early in the year, as part of the curriculum theme, "Family" (see page 20). Many children drew their families again in late spring.

T1 On the family charts--each family member is included, too.

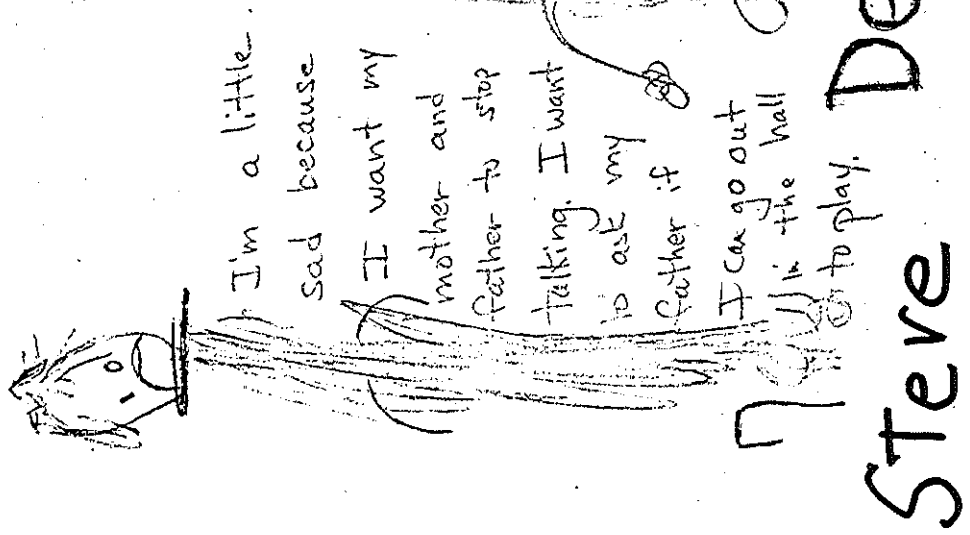
O2 And does the child understand he is a brother or sister to his own siblings?

T1 When I was doing the family chart with Steve, he said, "This is my mother," etc., and then he said, "This is David, Steve's brother."...and I think one time he said, "This is Steve, David's brother." He also, in his stories, refers to himself as Steve instead of "I," like he says, "Steve likes."

Teacher is finding out more about child. She has kept his family chart as a record. She is contributing to the discussion of how we can assess children's mathematical thinking from her own observation of Steve around his family picture.

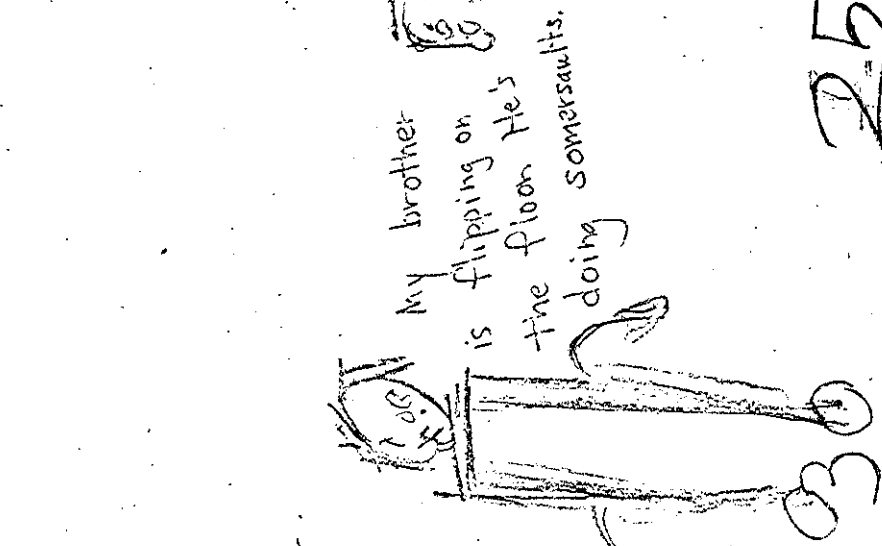
RECORD-KEEPING

One of the goals we have identified for the staff development process is the incorporation of record-keeping as an ongoing dimension of the teaching process. We realize that record-keeping places an additional burden on teachers and is something they find difficult to manage, but we also submit that informative records are an essential tool for teachers in the development of a challenging and appropriate learning situation for children. And we are convinced that teachers will keep records if and when they find that their records are useful and if a system is developed that makes the recording process manageable. We, therefore, chose to initiate record-keeping in an area which was of immediate concern to the teachers--children's friendships and interests--and to add other dimensions as the need for them was perceived by the teachers.

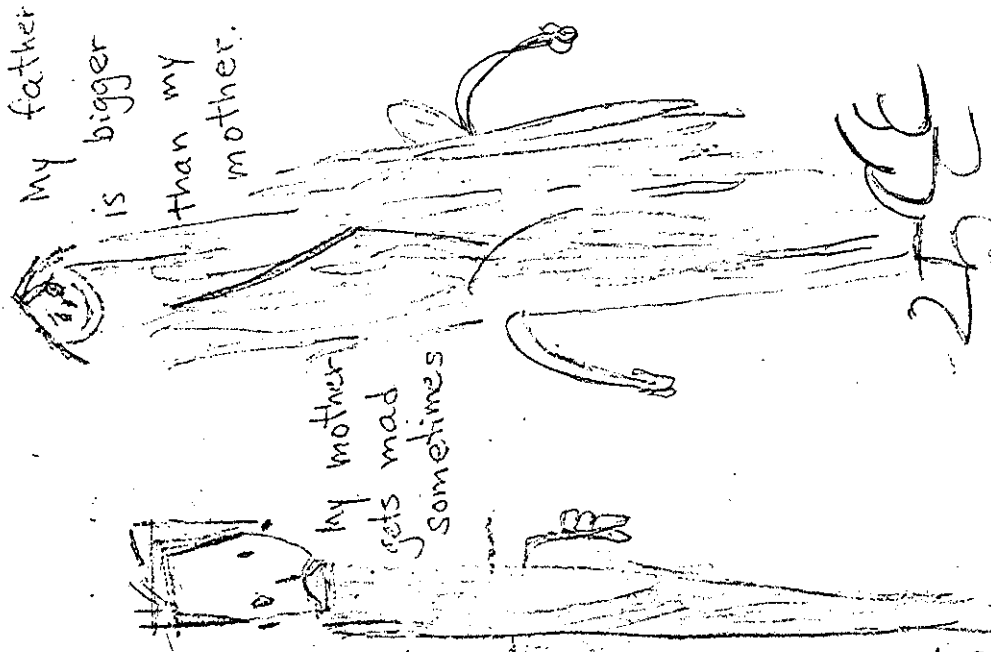


Steve

Derin



Clarissa



Gordon

The data in the following section has been organized to illustrate the teachers' changing record-keeping practices and attitudes toward record-keeping over the year.

November

The discussion is initiated by reference to the tape where children are weaving and Steve starts off going through the colors and choosing "red." The group includes Steve, Curly, Robert, and Lisa.

- S Hey, that was mine--blue, orange, red, and pink--and give me the scissors and...
C Hey, Steve, stop cutting and give me the scissors and don't touch.
R I can't do mine.
L What color you want--this one?
S Yeh, yeh, I got red now.

Record-keeping discussion follows workshop discussion of children's learning styles, abilities, and difficulties as revealed by the recorded conversation.

- T1 Yes. At the beginning he's picking out the colors. He knows his colors. We might make a list for each kid.
T2 We knew that anyway. That he knew his colors, except maybe orange.
O1 Still, if we're making a record about a kid it's good to put down what he knows as well as what he doesn't know. If for no other reason, it's nice to be able to tell his parents that he knows all his colors.

As staff developers, we were certain at this point only that some record-keeping was being done. The kinds of information recorded or the usefulness of records to the teachers had not been a part of our discussion.

- O1 Do you have a formal way to keep records on the kids?
T1 Each of us has a notebook where we keep notes on the kids we're working with, and I know I'm not as diligent as T2 writing it down.
T2 I'm not diligent. I just can't function unless I write it down.
T1 That's really the only formal instrument. That's one of my great weaknesses.
O1 Some people can keep it all in their heads and don't have to write it. I'm like T2. I have to write it down.
T2 When you keep it all in your head, it's all impressions. You have a sense of each kid, but it's not specific.

It is evident in this discussion that the teachers feel that record-keeping is theoretically "a good thing to do," but something they have identified as difficult for them to accomplish.

- T1 I can remember specifics, too, but I know it's not a good way of doing things. I know I should write things down. It's just doing it and getting into a habit.
O2 Records help you make comparisons through time as opposed to "a point in time," which I find helpful.
O1 Should we think up things to watch for with these kids we have talked about? What does he stick to and what is he interested in would be things to record about Steve. One way to find out would be what kind of thing does he talk about.

T1 He talks a lot about his father.

The staff developers are attempting to suggest a focus for record-keeping that will provide answers to teachers' questions about the children.

T2 Steve is very interested in Curly and really loves Curly. He likes to do things with him. He was the only one who wanted to listen to Curly read a story. He was the most responsive audience Curly could have asked for.

T1 That's right--that's right. It would be nice to know about friendships. Agreed, friendship is another thing to look at.

T2 And Karla and Mara are really good friends.

O1 Friendship groups. Children's interests and what they stick with will help planning. When we observe, let's try to set them up in friendship patterns. Pat Carini says friendship groups are the foundation of curriculum and I think she's right. The little play that's successful or the fantastic building is usually a friendship group.

O2 We need to focus observation around friends and interests.

T1 Knowing more would help.

O1 A record of who chooses to work with whom. Part of the time their choice in free time is determined by which child they want to work with. If we keep track of choices made in the choice time and then check which groups stay together, it will tell us something.

O2 I can think of some groups right now that I know have formed friendships, but there are those kids like David and Catherine that I haven't got in my head. David is still a mystery to me.

O1 If you want to know about David, you could check who he works with over a few days and look for a pattern.

Teachers and staff developers are looking for the same information and planning together how the observations can reveal the information. We are searching for ways to make record-keeping part of the observation process, instead of an additional separate activity that must be added to teachers' other responsibilities.

The discussion is about our ongoing record of the classroom: A log containing taped conversations, excerpted and annotated; excerpts from workshop sessions; profiles of individual children; data from conversations and workshops; curriculum extensions planned and topics we wish to pursue.

O2 Posie has systematically compiled observations and conversations re interests of the kids, and has filed them in this loose-leaf notebook.

O1 What I did was to pick out what seemed significant observations and points of interest coming out of our discussions, for our records. You can't keep the

- whole thing or you would have such a stack you wouldn't ever have time to read it.
- 02 I think the book is helpful now in terms of our conferencing and helping you work with the kids. Posie has organized our topics and in terms of children we have generated some hypotheses. Also we summarized the things we want to look for in terms of what we want to know: friendship groups, evidence of developmental level. Activities to be introduced are also listed as extensions.
 - 01 The book will stay in the classroom as a cumulative record for the year on the basis of which we can continue to plan. I made it loose-leaf so we can add to it. If you have other things you would like to have go into it, we should plan for that, too.
 - 02 Your journal notes that you both keep might help build up information about the kids.
 - 01 If this record is not useful to you, it's useless. Anything not useful to you, we should throw out because what we want to find out is what helps and what doesn't help. We need to find the best way to structure the record because there is too much otherwise.

The log represented our original concept of the kind of classroom record which might be useful to the teachers. In retrospect, much of what was in the book was not very valuable to them. The records relating to individual children and the complete observation tapes proved to be the ones of interest.

January: A discussion of how we might begin to keep records that will reveal friendship patterns.

- T1 I went through the notes for our last workshop during vacation and picked out just a few things that I thought I would try to look for in the coming weeks. One came out the other day when Curly and Corrine worked together in the block area. We had been talking about friendship groups that Curly might form and he has formed one with Steve. And then the other day when he formed one with Corrine, I thought to myself that this might be something to work on.
 - 01 Friendship patterns: Do we want to pursue this--records of choices children have made. I will try to graph them off to look for a pattern of who selected to work with whom.
-

It is evident that teachers are beginning to become more involved in the observing and recording process.

Their responses have shifted from questioning the usefulness of knowing about friendships to how to best collect information revealing friendship patterns.

Staff developers hope to demonstrate that the process of recording yields useful information.

- T1 I don't keep a record every day, but we sign up and I could keep the sign-up sheets.

- T2 Maybe that's not legitimate. When kids ask for help signing up, they weren't choosing by people. They were choosing by activities. I was pleased.
- T1 A few were--Artie and Jeff went over together and Artie said to Jeff, "What are you going to choose?"
- O2 We might begin to make some hypotheses about who seems to be working with whom. The other thing to watch is who sits with whom at lunch because that's free choice.
- T1 And they save each other places.
- O2 On Mondays and Tuesdays, I will keep track of that.
- T1 Let's run off dittos that have the tables to make it quick and easy. We could note on the sheet when the combination worked particularly well. For example, Steve and Corrine had a good time building in the block area.
- O1 That might be noted in your journals.
- T1 Yes. I did note it.
-

Teachers are now contributing ideas about what to record and how to make the recording process manageable.

- O1 How can we use your journals as contributing to a cumulative record, because I imagine they are quite private to yourselves.
- T1 I keep a record of what I do each day with the kids and make comments about it. It's not a separate book from the planning.
- O1 Do you summarize at the end of the week?
- T1 Yes. When I'm planning. But not elaborate.
- O1 It shouldn't be elaborate, but a consistent record which you don't mind sharing would help.

It became clear to us that teachers had a right to their private reflections, but that there was an equally important need to maintain a documentation record which was a collaborative effort between teachers and staff developers.

- T1 If there was place in the room to jot down observations, it would help. I can't find the time to go and write things down. Every year I try and find it impossible. You have so many things needing you. If it's striking, I usually remember and write it down that night.
- O2 Subconsciously you filter out the things that fit together. We all notice different things. We're not suggesting doing anything different from what you are doing now, but only to think about what you might want to do differently.
- O1 But a weekly 2- or 3-line summary for each kid probably is important. This will be important if we are going to develop an alternative to kids being evaluated only on standardized tests. You have something else to back up your knowledge that kids are learning. Last time, we planned too much, so we didn't do it. This time we have planned:

- 1) friendships
- 2) activities chart
- 3) lunch chart

We should think if there's some special thing that you would like me to try to observe, or some child. Joe, will you do the tables?

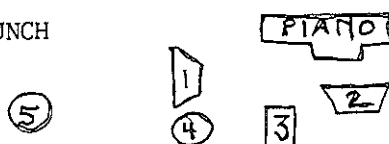
O2 Yes, and an observation of Kathleen.

T1 I'll save the choice charts and date them. The lesson assignments I will have in my "journal."

Teachers are starting to collect information but the main responsibility for collecting and collating this information rests with the staff developers.

Sample of seating choices is as follows:

SEATING CHOICES--LUNCH



	Hex 1 table	Hex 2 table	Rectangular table	Round table	Snack table	Absent
1/13	Curly Bobby Daniel Ralph Douglas	Kitty Bengy Jeff Artie	Mara Catherine Kathleen Rita Karla	Steve Corrine Karen	Robert	Lawrie David Rosie
1/14	Lawrie David Rosie Mara Karla	Artie Robert Kitty	Steve Daniel Corrine	Kathleen Jeff Bobby Bengy	Karen Catherine	Curly Ralph Douglas Rita
1/20	Artie Bobby Jeff Bengy Ralph	Robert Curly Karla Kitty	Rita Catherine Mara Corrine Kathleen	—	Daniel Karen	Lawrie Douglas Steve David Rosie
1/21	Artie Robert Douglas Kitty Karla	Steve David Corrine Mara	Kathleen Ralph Lawrie	Bobby Jeff	Catherine Karen	Rita Rosie Curly David Bengy

After experimenting with several forms, a chart was devised which could be posted on the wall so that teachers could conveniently check off children's activity choices and lunch seating choices each day (next page).

Sample Chart

Key	M	W
	F	
	T	Th

Activities

	Blocks	Sand	Paint	Lunch	
Betty	X	X		1	1
	X		X	1	
Carol			X	3	3
			X	2	4
Carl	X			5	
	X	X		3	4
	X			1	1
	X			4	
				3	2

March/Karla

- T1 She loved doing it, but then when that was over and it was time for her to choose something else, she didn't know what to do.
- O2 I thought we might try to look at what friendships she is forming because that seems where the need is.
- T1 This morning Mara came in late and Karla was really happy to see her. It's the first time I've seen her going up to someone and showing genuine emotion. That's the strongest friendship she has formed. She tends to join in what the boys are doing. When I'm with the boys she comes and joins in. Her seating choices for lunch--sometimes she sits with the girls: Mara, Catherine, Rita, Kathleen, and Karla--that's one group. Another time, Lawrie, David, Rosie, Mara, and Karla; Mara was there, too. She usually sits with her downstairs, now, too.

The teacher has kept records of a particular child's friendship pattern. She is also using this information in provisioning for the child.

- O2 Every day Artie, Douglas, Ralph, and Kitty sit together.
- T1 Ralph might be another possible friendship.
- O2 She admires his competence as a reader.
- T1 T2 and I were talking together. We decided Ralph and Daniel aren't working out very well reading together. Ralph is very competitive and Daniel just takes his time and he needs time to figure out words and to get them out and Ralph is getting impatient. So we plan to hook up Daniel and Curly so they can take their time and Karla and Ralph and try them reading together. We could set that up so they are together reading ev-

ery day and maybe we could extend that and they could choose some kind of activity together--related to the reading.

T1 Mara and Karla both have their emotional and social weaknesses, so you find they tend to sign up the least. They have a hard time deciding and Mara sort of pulls Karla into it (not signing up)--Karla is sort of following Mara.

There is a definite shift in the approach of the teacher to record-keeping. She has found time to collect information and has summarized her records of children's choices.

CHOICE ACTIVITIES OVER A TWO-WEEK SPAN

Artie

blocks - 5
sound - 3
origami - 1

Sand

Bobby
Robert

Blocks

Artie
Bengy
Corrine
Kitty
Kathleen
Rosie

Strong Groupings

Bengy

blocks - 3
sand - 1 assigned, but always
before meeting in
morning
sound - 1
construction - 1

Clay

David
Daniel
Jeff
Ralph

Very Little Signing Up

Carla
Mara
Steve

Bobby

sand - 6
blocks - 3
clay - 2
origami - 1
construction -

Sound Area

Lawrie

Paint

Curly
Rita

Curly

paint - 3
origami - 1
sound - 1
construction - 1

Construction

Karen

David

clay - 3
blocks - 1

Tinker Toys

Douglas

(continued)

Numbers refer to times children have signed up for the activity.

Douglas

Tinker Toys - 3
sand - 1
paint - 1
clay - 1

Daniel

clay - 4
paint - 2
Tinker Toys - 2
sand - 1
blocks - 1
construction - 1
sound - 1

Corrine

blocks - 2
paint - 1
clay - 1
crayon - 1
sound - 1

Karen

construction - 5
blocks - 2
sound - 2
crayon - 1
paint - 1
listening - 1

Kitty

blocks - 4
construction - 2
paint - 1
sound - 1
Tinker Toys - 1

Karla

construction - 2
origami - 1

Steve

blocks - 1
clay - 1

Kathleen

blocks - 2
paint - 1
Tinker Toys - 1
clay - 1
sound - 1
construction - 1

Mara

origami - 1

Rosie

blocks - 2
clay - 1
paint - 1
origami - 1

Rita (often signed up with
paint - 4 Karen)
construction - 3
sound - 1
clay - 1

Jeff

clay - 5
blocks - 4
sound - 1
construction - 1

Lawrie

sound - 2
clay - 1
Tinker Toys - 1
listening - 1

Robert

sand - 3
clay - 3
blocks - 1
sound - 1

Ralph

clay - 5
sand - 1
blocks - 1
origami - 1
sound - 1

T1 Rita switches around a lot--she and Karen were often together when I was checking activity choices. She could be included into any group and interact.

For planning--I need to go through notes. Then I can jot down the kids we need more information on, and think of some groupings we could set up including those kids. I would like to get more information particularly on some of the younger kids.

The teacher is now using information from her records. She is also requesting directed observations to fill in her information about the children.

O2 I see us moving away from curricular planning and more into trying to tie up what we know about the kids.

T1 In talking to next year's teachers it will be helpful in verbalizing what's going on with kids at this point and also for end of the year reports.

Reflections and Next Steps

We made a start at building up an information base through recording children's friendships and interests, which provided one source of information from which the teachers with whom we worked could begin to assess the effectiveness of the classroom program. We see this process beginning to develop in the movement back and forth between a concern about the appropriateness of the curriculum for an individual child and a consideration of the curriculum for the classroom as a whole. This point was well illustrated when the teacher, recognizing Karla's readiness for grouping, was led to consider whether other children in her class were also ready and how she would adjust her math curriculum to provide for this learning. However, we recognize that we need to develop more comprehensive record-keeping systems, information from which teachers can make critical assessments of their basic curriculum as it is or is not meeting the learning needs of the particular children in their classrooms.

Departing from a standard prescribed curriculum is an extremely difficult step for a teacher to undertake. If she follows the syllabus skillfully, and the children still fail to learn it, then it is probable that the failure will be seen as the children's. If she departs from the standard curriculum and the children don't learn what is expected of them, then the failure will probably be laid at the teacher's door. Thus, it follows that teachers can and should only make basic changes in their curriculum as they recognize the reasons for the changes. Furthermore, they need to be able to explain the reasons for their curriculum decisions and back them up with data from their records.

In relation to our own role as staff developers, we find that the format of taping workshop discussions and reflecting upon this material provided an opportunity for us to maintain a dimension of self-study that we needed to be responsive agents in the learning process of the teachers.

We have viewed our relationship with the teachers as a developmental, interactive one. Within this relationship, we think it is critical to be able to assist teachers in reflecting upon and clarifying their beliefs and assumptions about children and their learning. However, it is also critical for persons attempting to nurture growth from this approach to be able to analyze and assess

their own behavior. They need to look at the degree to which they stimulate thinking about teaching by their questions. They need to be able to know more fully their own values and beliefs in order to understand their goals and agenda for teachers and children. We found the experience of listening to ourselves talk both humbling and stimulating. As workshop leaders, we largely dominated the workshop discussions at the beginning stages. While this may be partly typical of the pattern of the process, in retrospect we feel that we talked too much and that it would have been advantageous to solicit more teacher participation by well thought-out questions. Had we done this, it most likely would have added depth to our discussions.

At the same time, while increased teacher participation is something to be fostered, it is important to continue to focus the discussion on the taped material, or at least on actual concrete observations of children. Discussions that branch out into generalizations and philosophizing detract from the effectiveness of the process.

What are the immediate next steps for expanding the practical application of this method for inservice teacher support? We can suggest several:

- Involve other staff developers in participating and becoming familiar with this work;

- Involve teachers in both the actual recording/transcription of taped material and as leaders of workshop discussions about this material;

- Inform parents more directly and descriptively about their children's interests, growth and development, learning needs, and progress;

- Convince school administrators that the process has potential for inservice programs for teachers--explore the practical questions of how this type of staff support can be incorporated into the school system.

In a more general way, we need to continue our work with teachers over a longer period to find out how the process of support should be adjusted to respond to teachers' changing needs. We also need to explore the record-keeping process as a way of responding to the inadequacies we find in standardized tests, both for program development and the assessment of student progress. We see systematic record-keeping as one essential first step toward more useful forms of evaluation. Once we have a basis of informative data, it will be possible to work with evaluators to develop broader measures for child and program assessment. Therefore, an exploration of the kinds of records that are useful to teachers, as well as manageable, has a high priority for us.

We have developed a process for looking at the classroom program. We conceive of this process as having

an evaluative function. We see it as responsive to the question, "Is Johnny learning to read, and how is the program supporting that learning?" We are not trying to answer the question of whether Johnny can read better than Billy. Furthermore, we see the process as having the potential to provide an ongoing assessment of Johnny's development (social and emotional, as well as academic) over a longer time period than a single academic year.

Overall, our goal is to influence the evaluation of child outcomes both as to what gets looked at and how it gets looked at. We are interested in a whole range of things related to Johnny becoming a reader which tests do not take into account: does he see himself as a reader, does what he reads have meaning for him, does he enjoy reading? We believe that this assessment must be undertaken through careful observation of the child within the classroom setting in order to be able to understand and describe both what he has learned and how he is able to make use of his learning.

From this concern about the evaluation of child outcomes emerges an equally important concern about the evaluation of teacher effectiveness. We believe that effective teacher-learner interactions will be supportive rather than controlling, respectful rather than judgmental, and, above all, varied, depending upon what the teacher knows about the child's point of view, educational and emotional needs, and particular strengths and interests. Specific teacher-child interactions will depend upon the teacher's knowledge of each child and ability to translate this knowledge into action appropriate to meeting these needs.

Other considerations of teacher actions contributing to effective teaching place great emphasis on the reflective phase of teacher behavior. To be effective, teachers, we believe, must be willing to constantly look at and reflect upon their teaching, and to make changes and adjustments from a constantly widening knowledge of their students and understanding of the learning process, with the realization that teaching can always be more effective. We submit that the most important single determinant of effective teaching is the teachers' ability and willingness to examine what they know about the children they teach. We do not focus as much on specific teacher behavior as on the thinking behind the behavior.

We hope, too, to influence the design of evaluations related to teacher effectiveness, to the extent that their primary concern is with *why* the teacher selected a particular material or activity for the child and *how* she chose to implement or extend the curriculum around this material or activity. We suggest that these questions of why and how are the most useful ones as measures of teacher growth and can best be assessed through observation and descriptive interviews.*

Finally, we hope to influence program evaluation in the direction of practices that provide not only information about what occurred but reveal why and how these out-

*Promising work, along these lines, has been started by Garda Bowman and Rochelle Mayer at Bank Street College with the development of the Brace Instrument, and at ETS by Ted Chittenden, Anne Bussis, and Marian Amarel with the development of an interview study with teachers, entitled "Beyond Surface Curriculum: An Interview Study of Teachers' Understandings."

Edith H. E. Churchill is a consultant to Cambridge (Mass.) Follow Through and Hanscom Primary School, Lincoln, Mass. As a staff member of Educational Development Center, she worked on the Elementary Science Study, Follow Through, and the Open Education Advisory. Joseph N. Petner, Jr. is staff developer for Cambridge Follow Through.

comes emerged. In order to be useful, this evaluation must be related to program goals and must provide information that will lead to program improvement.

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