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ABSTRACT

A study of patterns of literacy behaviors in high level literacy environments with varying levels of access to the environment began with a study of the instruments involved. Goals were to: (1) examine the reliability of the Survey of Displayed Literacy Stimuli; (2) study the correlation between scores from the Survey of Displayed Literacy Stimuli and the Inventory of Access: Displayed Literacy Stimuli to see whether they represented the same variables; (3) determine index scores for the survey and the inventory which best represented each environment's characteristics; (4) distinguish surveys that offered high levels of stimuli or acc ,s from those that did not; (5) determine whether the revised Literacy Observation Matrix identified a larger proportion of literacy behaviors, in relation to all recorded behaviors, than did the previous version; and (6) determine the extent to which observers could distinguish between assigned and optional literacy behaviors through the revised matrix. A total of 140 children from 17 kindergarten and primary classrooms served as subjects for the second phase of the study. A team approach was used to gather data by means of the instruments, through observations, and through conversations with teachers. Findings showed that an environment that functions on behalf of children's literacy is established through spatial organization and the teacher's provision of print, symbolic materials, and tools and materials for literacy. The distribution and arrangement of literacy materials and of display facilities for children's use affect the extent to which children respond and contribute to the literacy stimuli of the environment. Related materials are appended. (HOD)

LITERACY BEHAVIORS OF KINDERGARTEN-PRIMARY CHILDREN IN HIGH STIMULUS-LEVEL LITERACY ENVIRONMENTS

Part I: The Instruments

Part II: Environments and Literacy Behaviors

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Spring, 1987

LITERACY BEHAVIORS OF KINDERGARTEN-PRIMARY CHILDREN IN HIGH STIMULUS-LEVEL LITERACY ENVIRONMENTS

PART I: THE INSTRUMENTS

This descriptive study was designed to describe children's participation in literacy within classroom environments organized for the purpose of stimulating spontaneous literacy (Loughlin and Suina, 1982); it examines patterns of literacy behaviors in high level literacy environments with varying levels of access to the environment. The research builds upon previous study of the literacy content of classroom environments(Loughlin and Ivener, 1984; Loughlin and Cole, 1983). It has two major purposes: a study of instrumentation (see Loughlin and Ivener, 1984) and a description of literacy environments and children's literacy behaviors within them. Specific goals for the study of the instruments follow:

1. Examine reliability of the Survey of Displayed Literacy Stimuli.

2. Study the correlation between scores from the Survey of Displayed Literacy Stimuli and the Inventory of Access: Displayed Literacy Stimuli to see whether they represent the same or different variables.

3. Determine index scores for The Survey and for The Inventory which best represent each environment's characteristics and also distinguish those which offer very high levels of stimuli and/or access from those which do not.

4. Determine whether the revised Literacy Observation Matrix identifies a larger proportion of literacy behaviors, in relation to all recorded behaviors, than the previous version.

5. Determine the extent to which observers can distinguish between assigned and optional literacy behaviors through the revised Matrix.

The Pilot Study

A pilot study (Loughlin and Ivener, 1984) was carried out in two schools, using earlier editions of the three instruments (Survey, Inventory, and Matrix) in 22 classrooms with varying levels of literacy stimulus and of access. Data from the study showed the instruments to be promising, but in need of revision. The data on literacy behaviors was regarded as tentative for two reasons. The distinction between chosen literacy behaviors and those assigned was not clearly made through the Matrix, and it was felt that many instances of literacy behaviors were lost through recording in the NA (no literacy activity) category. However, the tentative data directed attention to further study of children's literacy behaviors in high stimulus level literacy environments, and the examination of access to displayed literacy.

Revision of Instruments

As a result of the pilot study, some specific questions raised about the three instruments directed their revision. The revised Instruments, used in the current study, are included in Appendix A of Part I.

The Survey of Displayed Literacy Stimuli

There was no single index available in the original survey instrument which could distinguish high stimulus level environ-

ments from those which were not, so environments had been categorized on the basis of four criteria.(Loughlin and Ivener, 1984). After a study of the survey data, two categories were shifted from the counted category group to the noted but not counted group, and recoded data further examined. Classrooms ranked on the basis of the five criteria used in original scoring were then ranked by several different potential index-scores. It was found that the Counted Category Total score produced the same rankings as the recoded data ranked on the four original criteria, so the Counted Category Total became the Index for Literacy Stimulus Level.

From the training of observers and the process of using the Survey during the pilot study, several areas of confusion within the category definitions were identified. Definitions were revised where necessary, in order to clarify meaning and reduce ambiguity, and the general rules for including or excluding an item from the list were also clarified.

As the instruments and their data were studied, some patterns of literacy support within environments were revealed; an additional scoring sheet was added to the instrument to highlight those patterns. Several literacy functions, and the specific categories within them, were identified:

Functional Use Score: current day messages; displayed directions; sign-up sheets; different references; functional labels

Child-generated Score: current child-written messages

Communication Score: child-written messages; display space; display tools; clearly legible displayed print

Variety Score: kinds of books; kinds of recording tools; kinds of recording materials; different references

Content Score: print related to nearby objects; books related to nearby objects; community language/culture print

Book Use Score: kinds of books; books related to nearby objects; books with cover displayed

The categories of displayed literacy stimuli recorded on The Survey were the only items which could be recorded as used on The Inventory of Access in each environment. However, the three book categories (books related to nearby objects; different kinds of books; books with cover displayed) could not be distinguished when the stimuli were in use; once books were in children's hands, it was no longer evident how or where the books had originally been displayed. To clarify this, the three book categories were collapsed into one (books), and when the survey data for an environment was transferred to the inventory record, the sixteen categories were reduced to fourteen.

The Inventory of Access

The Inventory of Access was revised to show the collapsed category of books in the list of displayed literacy stimuli; then a scoring sheet was added so observers could compile the data from the record sheets immediately following the day of observation. Some procedural changes were also made.

After the pilot study, in which inventory scans were made at 20 minute intervals by a single observer, it was seen that in many environments there were some time periods (such as

transitions) when usage was not recorded, although data from such periods in other classrooms seemed significant. In order to capture children's use of literacy stimuli more fully, procedures were changed. Two observers were to conduct alternating, continuous scans throughout the day, and they were asked to note general events (i.e. self-selection; independent seatwork time) which ocurred during each scan. Different procedures were developed for the inventory in double-sized classrooms, because of the increased number of children per scan. A split scan procedure was designed, with each observer identifying approximately 1/2 of the students (usually by gender) and the half-scans combined when data was compiled.

Because of the variation of class size (ranging from 15 to 43) a new index for access was needed. The score used during the pilot study (number of uses per scan) was then divided by the number of children scanned to provide the score: access per child.

Further questions about The Inventory of Access are discussed in the section on Study of the Instruments.

The Literacy Observation Matrix

The pilot study data showed well over half of all observed behaviors recorded as NA (No Literacy Activity), yet observers felt that there were literacy behaviors lost in that category because they were not included in the defined categories to be coded. In the study of The Matrix after the pilot study a group of observers applied the instrument within classroom settings;

this was accompanied by open observations. As a result, two new categories (discussing and scanning) were added. The category no literacy activity is redefined to reflect the additional categories, and the not located category remains unchanged.

Administering The Literacy Observation Matrix revealed some training and categorizing problems with the previous Voluntary and Assigned subcategories. It appeared that the differences between an activity and a behavior had not been clear to observers through the directions. Teachers frequently assign activities, but not necessarily all the behaviors used within them; this leaves some behaviors within an activity optional. When a child can choose to use or not to use a particular literacy behavior within an assigned activity, that behavior is now coded as Optional. For example, a group of children are assigned the activity of making daily observations of some samples of food left in open petri dishes, and to record their observations. How to record is left to the individuals, whose specific literacy behaviors during the recording process are optional. Some record with print, consulting dictionaries or scanning displayed print for information as they record, manipulating the recording materials as they prepare. Some observe others' activity for a while before choosing their own form, several talk together about how they plan to record, then consult during the process. These reading, scanning, manipulating, observing and discussing behaviors are optional; recording is assigned.

The Literacy Observation Matrix procedures and categories

were clarified and redefined as a result of these examinations of the instrument. The Teacher Questions sheet was also revised so it could elicit the information needed to distinguish between assigned and optional behaviors.

Study of the Instruments

Three analyses, for study of the research instruments, were planned: reliability studies for The Survey of Displayed Literacy Stimuli, correlation studies between The Survey and the Inventory of Access, and comparison of categorized and unidentified (coded as NA) behaviors of the original and revised Matrix. Procedures, analyses and findings follow.

Reliability of the Survey

Questions of consistency in application of The Survey were raised after the pilot study, since individual surveyors reported varied interpretation of some definitions, even after several training sessions. To further study this problem, procedures were changed to require two members of the team to conduct The Survey in each environment at the same time, but independently; they were to collaborate only on identification and naming of the specific areas to be surveyed on the sketch maps. Reliability studies of paired Survey data are reported in a following section.

Data gathering procedures called for the Survey of Displayed Literacy Stimuli applied to each classroom in the study by two observers simultaneously, when the classroom was empty of

children. Literacy environments are quite fluid, changing daily, and displayed literacy stimuli are frequently moved about the environment while in use. The requirement for simultaneous surveys and empty classrooms were imposed to be sure both were surveying the same arrangements. After drawing independent sketch maps of the environment, then agreeing upon the spatial divisions to be used in the survey, the observers could proceed with the survey independently. Following extensive training, the procedures were carried out in 12 of the 17 subject-classrooms; however it was not possible in the others, because of the size of the environment (double-classroom settings where it was necessary for each to survey half the environment then combine data) or because of scheduling problems.

A correlation coefficient performed on the Survey Index Score (counted category total) in 10 environments showed a positive correlation of .98. An additional correlation coefficient was computed for all category subscores in each of 5 randomly selected pairs of Survey Record Sheets with the following results:

CORRELATION COEFFICIENTS FOR CATEGORY SUBSCORES ON PAIRED SURVEYS IN FIVE ENVIRONMENTS

Environment	r
S-1	.92
K-1	.98
M-4	.99
F-4	1.00
F-1	.99

As a result of the analysis of Survey scores and subscores, reliability of the instrument is seen as acceptable. That is, trained observers who survey the same environment at the same time, will show general agreement on category subscores of The Survey , and will characterize the environment's level of literacy stimulus in similar ways.

Correlations Between Survey and Inventory

In the procedures for this study, The Survey of Displayed Literacy and The Inventory of Access each provided a basic score for every classroom studied. They consisted of total items in counted categories (Counted Total) for The Survey, and number of uses per scan divided by number of children present (Access per Child) for The Inventory. The product moment correlation was computed for these two basic scores, in order to verify (or deny) that the instruments are focusing on different variables.

The results of the analysis show a correlation of .20, showing that The Survey data and The Inventory data are somewhat related, but do not represent identical characteristics of the environments. The low correlations between the two give sufficient confidence in the data to include it in the analysis of classroom characteristics. However, "field note" data leads us to believe that while The Inventory helps identify the access characteristics, it is not a sufficient description of children's access to literacy. This is further discussed in Part II: Environmental Characteristics and Literacy Behavior.

Literacy Observation Matrix

In the pilot study data from the Literacy Observation Matrix, approximately 40% of the observed behaviors were recorded in the NA (no literacy activity) category. After the addition of two new categories (discussing and scanning) and use of The Matrix in the environments of the current study, approximately 35% of observed behaviors appeared in the NA category. Together, the categories of discussing and scanning accounted for 12.5% of all recorded literacy behaviors, suggesting that at least a part of the literacy behaviors previously buried in the NA category can now be identified.

Through the earlier version of The Matrix, in which literacy categories were further identified as "voluntary" or "assigned", the behaviors coded voluntary accounted for approximately 33% of all recorded literacy behaviors. Data from the current study, gathered through the revised Matrix showed approximately 37% of literacy behaviors optional. Although the differences could be a reflection of the environments observed in the current study rather than a better operational definition of the terms, observers reported more confidence in their coding with the clarified definitions for "optional" and "assigned".

Conclusions from Instrument Studies

The three descriptive instruments offer data that seem to be reliable (for The Survey), to tap at least part of the variable of access (The Inventory), and to capture a reason-

able proportion of the kinds of behaviors which could be labeled as literacy (The Matrix).

We conclude that the data is useful, should be further analyzed to describe stimulus level, access to displayed literacy, and to observe subject's literacy behaviors in those environments described. The instruments used in this study are included in the Appendix.

Afterword

After the data had been analyzed in the current study, The Survey of Displayed Literacy Stimuli was re-written, but not revised. Some editing of the definitions, and a re-ordering of the counted categories to reflect the literacy function groups (listed on page 3-4) made The Survey easier to use. In addition, the function-score record sheet, added for this study, has become a permanent part of The Survey.

APPENDIX A

The Survey of Displayed Literacy Stimuli

The Inventory of Access: Displayed Literacy Stimuli

The Literacy Observation Matrix

SURVEY OF DISPLAYED LITERACY STIMULI

C. Loughlin, N.Cole
University of New Mexico
January, 1984

The Survey of Displayed Literacy Stimuli can be used to examine a learning environment to see what level of stimulus and support for spontaneous use of literacy behaviors are offered in various areas. The survey offers information on:

The pattern of distribution of the literacy stimuli throughout the environment, and a comparison of one area to another in terms of literacy potential. Are there any areas, for instance, where children may spend time without encountering any stimulus for the use of literacy?

The kinds of literacy stimuli offered in the environment and in particular areas of the environment. For instance, which skills are elicited by the types of tools and information sources displayed for access? What variety of materials, tools and print exist in areas? How widely is functional print distributed? To what extent are the content and meaning of print emphasized by combinint books and print with non-print materials? Are the stimuli for the use of literacy accompanied by the means for response to that stimuli?

HOW TO USE THE SURVEY

1. LOOK AT THE CLASSROOM

   Look at your classroom environment or a sketch-map of its arrangement. Divide the total environment into different areas, deciding which space and materials are part of each area. (Be sure all classroom space is included.) List each area at the top of the survey record. You will be examining one area at a time.

2. SURVEY ONE AREA AT A TIME

   For each area you will survey, enter the area and seat yourself so you are seeing all displayed materials at child's eye level. With the category definitions beside the survey record, begin to survey. COUNT ONLY THOSE MATERIALS THAT ARE DISPLAYED AT CHILDREN'S EYE LEVEL OR BELOW. Complete the survey and recording for all literacy stimuli categories in one area before going on to the next.

3. COUNT ONE CATEGORY OF LITERACY STIMULI AT A TIME

   Keeping the category definitions beside the survey record, cout all visible literacy indicators in the particular category you are checking. Re-check the definitions for the category each time you are ready to count. (Remember, a number of objects that are stored away in the area will not be counted because they are not displayed.) Record the number of instances in one category by talley or numeral before you go on to the next category.

4. YES or NO CATEGORIES

   The last categories on the survey sheet are not counted. First re-check the category definition. Then examine the area for the presence of the stimuli described in the category, and record its presence or absence.

5. TOTAL

   To compare one area of the classroom with another, total each column. This will show where the stimulus for literacy is in the environment.

   To compare the categories of literacy stimuli to see the relative emphasis on different kinds, total the records across each row. This will show the variety of stimulus and support for the use of literacy behaviors in the environment.

THE SURVEY OF DISPLAYED LITERACY STIMULI

Loughlin/Cole
January, 1984

Each item must be clearly visible, and within child's eye level/range.

CATEGORY DEFINITIONS

1. messages about the current day : schedules, assignments, notices, groupings, news, announcements needed to work through the day. These are clearly related to events on the day of survey.

2. current child written or dictated messages, labels, stories : less than five days old! Determined by dated material, or by asking. Exclude: groups of completed assignments displayed together.

3. print or writing segments related to nearby materials, objects, pictures : these are placed close to pictures or other materials, with the contents of the print or writing clearly related to those materials in some way. Exclude: labels, also children's illustrated stories, except when they are also related to other nearby materials.

4. books related to nearby materials, objects, pictures : books, located in combination with other materials, objects, or pictures, and whose contents are clearly related to those materials in some way.

5. different kinds of books : the number of different kinds of books available for children's choice, and clearly visible (i.e. trade, reference, child-made,etc.) Do not count total volumes in the area.

6. different kinds of recording tools: the number of different kinds of tools for children's use in recording events, ideas, information (i.e. pencil, crayon, tape recorder, chalk.) Do not count duplicates in any area.

7. different kinds of recording materials : the number of different kinds of materials for children to record upon(i.e. audio tape, stationery, chart paper, chalkboard, drawing paper. Do not count duplicates in any area.

8. different references : lists, pictures, charts, or other information sources children will use as references to help with ongoing activities. A set of references (i.e. encyclopedia) stored together is counted as one reference. Single volumes, placed in other locations, are counted. Do not count duplicates in any area.

9. displayed directions for activities : displayed task cards or charts that give directions for activities or procedures that children can carry out independently.

10. sign-up, sign-out charts or sheets : any teacher-prepared chart or sheet, clearly displayed, that calls for children to record information in print or symbol, or to sign names.

11. community culture/language books or print segments : books and print segments in children's home language, or reflecting home culture, in a fairly homogeneous linguistic/cultural community.

12. presence of empty display space : empty space in the area, where children may post their own work.

13. presence of display tools : tacks, tape, label blanks, and/or other tools children can use to display materials.

14. presence of functional labels : there are working labels on holders, cabinets,or equipment that give information about contents, use, or procedures.

15. presence of books with cover or page displayed books in the area with covers clearly visible, or displayed opened to a particular page.

16. presence of displayed handwritten or print segments, clear and legible : print and/or children's or teacher's handwritten material, displayed on unpatterned background, with empty space surrounding the segment. Print or writing is large enough to be seen/read by children in the environment.

THE SURVEY OF DISPLAYED LITERACY STIMULI

Loughlin/Cole
University of New Mexico
January, 1984

Each counted item must be clearly visible, and within child's eye level/range. Definitions attached.

Record Actual Count

DISPLAYED LITERACY STIMULI (AREAS)										TOTAL BY CATEGORY
1. messages about the current day										
2. current child written or dictated messages, labels, stories										
3. print or writing segments related to nearby materials, objects, pictures										
4. books related to nearby materials, objects, or pictures										
5. different kinds of books										
6. different kinds of recording tools										
7. different kinds of recording materials										
8. different references										
9. displayed directions for activity										
10. sign-up, sign-out charts or sheets										
11. community culture/language books or print segments										
12. presence of empty display space										
13. presence of display tools										
14. presence of functional labels										
15. presence of books with cover or page displayed										
16. presence of displayed handwritten or machine print segments, clear and legible										
TOTAL PER AREA										

Record 1 or 0 (for yes or no)

1-11 Total

1-16 Total

Date_____ Special Conditions_____

Number of Areas Surveyed_____ Counted Item Total_____ Overall Total___

Classroom and Grade Level_____ Observer_____

SURVEY OF DISPLAYED LITERACY STIMULI Score Sheet

Observer_____ Date_____ Classroom_____ Grade/Age_____

AREAS

No. areas surveyed _____

No. areas with all 1-10 categories _____

No. areas with all 12-16 categories _____

No. areas with category 11 _____

CATEGORIES

No. 1-11 categories in environment _____

No. 12-16 categories in environment _____

QUALITY SCORES

Functional Score-categories:

1_____
8_____
9_____
10_____
14_____
T_____

Child-generated Score-category:

2_____

Communication score-categories:

2_____
12_____
13_____
16_____
T_____

Variety Score-categories:

5_____
6_____
7_____
8_____
T_____

Content Score-categories:

3_____
4_____
11_____
T_____

Book Use Score-categories:

4_____
5_____
15_____
T_____

TOTALS

Categories 1-11 score [ ]

Categories 12-16 score _____

Grand Total_____

*note
This score sheet is used only when Survey is a research tool. Boxed total is the basis for comparison and/or ranking.

INVENTORY OF ACCESS: DISPLAYED LITERACY STIMULI

C.Loughlin, J.Suina, N.Cole University of New Mexico, 1/85

The Inventory of Access:Displayed Literacy Stimuli is designed for use with The Survey of Displayed Literacy Stimuli, and a Sketch Map of the Environment to be observed.

DIRECTIONS FOR THE INVENTORY SCAN

1. Make a sketch-map of the environment, showing spatial organization. Clearly mark and label areas within the environment. All classroom space should be included in these areas.

2. Carry out the Survey of Displayed Literacy Stimuli, using the same area boundaries and labels shown on the sketch-map.

3. Fill out the front of the Inventory, with classroom information. Under the heading CHILD, list all children using the environment.. If you know children by name, use names; if not you will need to devise your own system. Under AREA, list all area labels from the sketch-map and Survey.

4. When ready to begin, record the time. Also record the events scheduled at this time (i.e. going to recess, independent work period, self selection, reading.)

5. One at a time, look at each child and record. Look long enough to see the area where the child is, the literacy stimulus being used, the social interaction, and the physical activity. RECORD ONLY THOSE OBJECTS WHICH HAVE BEEN IDENTIFIED AS DISPLAYED LITERACY STIMULI THROUGH THE SURVEY.(This should take about as long as it takes to make a snapshot.

6. When all children in the environment have been observed and data recorded, wait for an interval of time, and repeat the observation on a new scan-record.

INVENTORY CATEGORIES

AREA: The area in which the child is located, as shown and labeled on the sketch map.

DISPLAYED LITERACY STIMULUS: The displayed literacy stimulus with which the child is engaged (record only materials identified through the Survey of Displayed Literacy Stimuli.

SOCIAL INTERACTION WHILE USING LITERACY STIMULUS; is the child interacting with a teacher, a child, children, or not engaged in social interaction.

PHYSICAL ACTIVITY: child's physical activity while engaged with a displayed literacy stimulus (i.e. observe, point to, show to someone, hold, manipulate.

SCORING

1. Using a separate section of the score sheet for each inventory scan, list and tally the recorded uses of Displayed Literacy Stimuli, and enter the count for each. Record time and even information

2. For the Summary, record names of each Inventory DLS category used, and total uses for each category. Record the total number of categories, total uses on each category, and number of inventory scans.

3. Calculate Average Uses per Scan, using totals of all categories and scans, and number of scans. Note the number of Inventory DLS shown in original survey, and number recorded in use during the Inventory.

Loughlin/ Suina/ Cole - 1/84

INVENTORY OF ACCESS- DISPLAYED LITERACY STIMULI

USE = Direct observation of indicator.
Physical contact with indicator.

(Adapted from the Location Action Material Inventory, Institute for Developmental Studies.)

Classroom: _____

Time: _____ Date: _____

Observer: _____

Event: _____

CHILD	AREA	STIMULI	SOCIAL INTERACTION WHILE USING LITERACY STIMULI	PHYSICAL ACTIVITY
·Name or other identification.	·Areas listed in literacy survey. ·Areas indicated on sketch map.	.Current day message .Child-written/dictated .Print/writing-materials .Book .Recording tool .Recording materials .Reference .Displayed directions .Sign-up, sign-out .Community/culture print .Display space .Display tool .Functional label .Displayed print segment	·Teacher ·Child ·Children ·No social interaction Record only if child is using a displayed literacy stimulus.	·Observe ·Point to ·Show to ·Hold ·Manipulate

CHILD	AREA	STIMULI	SOCIAL INTERACTION WHILE USING LITERACY STIMULI	PHYSICAL ACTIVITY

CHILD	AREA	STIMULI	INTERACTION	PHYSICAL ACTIVITY

[illegible] ______ Observer ______ Date ______ Grade ______ Classroom ______

Time ______ DLS: Category Talley Count Event	Time ______ DLS: Category Talley Count Event	Time ______ DLS: Category Talley Count Event	Time ______ DLS: Category Talley Count Event
Time ______ DLS: Category Talley Count Event	Time ______ DLS: Category Talley Count Event	Time ______ DLS: Category Talley Count Event	Time ______ DLS: Category Talley Count Event
Time ______ DLS: Category Talley Count Event	Time ______ DLS: Category Talley Count Event	Time ______ DLS: Category Talley Count Event	Time ______ DLS: Category Talley Count Event
Time ______ DLS: Category Talley Count Event	Time ______ DLS: Category Talley Count Event	Time ______ DLS: Category Talley Count Event	Time ______ DLS: Category Talley Count Event

DLS USED	TOTAL USES
______	______
______	______
______	______
______	______
______	______
______	______
______	______
______	______
______	______
______	______
______	______
______	______
______	______
# ______ (Collapsed categories)	TTL: ______
No. Inventory Scans	______
Average Uses DLS per Scan	______
No. C/DLS Categories Shown on DLS Survey	______
No. C/DLS Categories Used	______

2.)

2.)

LITERACY OBSERVATION MATRIX

Bonnie Ivener
Fall, 1984

The primary purpose of the Literacy Observation Matrix is to record children's writing, reading, observing, discussing, and manipulating behaviors related to literacy, using a timed spot observation technique. The matrix is designed to record behavior when subjects are directly attending to to literacy materials (see Loughlin/Cole, 1984) in the learning environment. The user should become familiar with definitions of the literacy behaviors before beginning.

The Literacy Observation Matrix can be used to provide information concerning which coded behaviors (below) occur; which are most frequent over the span of a week's time; which occur by direct teacher assignment; which are optional; which are performed by girls and which by boys; and which literacy behaviors are predominant in a classroom. It is designed for use with the Survey of Displayed Literacy Stimuli, and Inventory of Use: Displayed Literacy Stimuli.

The upper part of the matrix includes spaces to record a variety of information.Record that information which is of interest to you.

HOW TO USE THE L.O.M.

- Familiarize yourself with the classroom arrangement, and the literacy materials available for children's use.
- Select the children to be observed and prepare a record form for each child, completing the upper part of the matrix. (When children are not known by name, some other identification may be sufficient.
- Position yourself within 5 feet of the child being observed.
- Set an unobtrusive timing device to signal every 5 seconds for a total of 5 minutes.*
- Record one of the following symbol notations per matrix cell. BEGIN observing and recording after the first 5-second signal.
- Upon conclusion, total the number of instances each literacy behavior occurred at the end of the five-minute observation.
- Repeat this procedure each day of the week, and at different times of the day, to have a full picture of the child's assigned and optional literacy behaviors.
- At the end of one week's daily observations, compute weekly averages per literacy behavior for each child observed.

* The amount of time spent observing may be adjusted by the matrix user. Thus, the 5 minutes may be lengthened and the matrix record form adjusted accordingly.

BEHAVIOR CODES* AND DEFINITIONS

(W) or (W_o): Writing - the act of recording messages in some form using a kind of recording tool and material; the act may range from recording a check mark on a graph to writing an essay.

(R) or (R_o) Reading - the act of visually attending to print or symbols with or without vocalization; the act may range from fixating on whole texts or upon shortened temporary messages, signs, letters, pictures, but the material must be within 5 feet of the child.

(S) or (S_o) Scanning - the act of looking toward displayed literacy materials more than 5 feet away, while in direct contact with other literacy materials.

(M) or (M_o) Manipulating - the act of readying tools and materials for use, drawing or constructing, turning pages, sharpening pencils, stapling, gluing, cutting, erasing, and/or folding.

(O) or (O_o) Observing - the act of visually attending to a peer or adult writing, reading, or manipulating (as defined above) with or without vocalization and physical contact.

(D) or (D_o) Discussing - the act of talking with another person while holding literacy materials, or to a person holding literacy materials,but not writing, reading, manipulating, or observing.

(NA) No Literacy Action - the act of not handling a literacy material or visually attending to a literacy material; this includes standing and waiting for a turn, sitting idle, hiding, resting, whistling, talking in the absence of contact with literacy materials, gazing at the teacher or peers more than 5 feet away,looking into another room or out a window.

(NL) Not Located - the child is present but not visible to the observer during the spot observation period, or has left the environment.

*Use the [$_o$] code when the behavior is optional rather than assigned.

Assigned - the behavior is required within an activity and must be done at a particular time designated by the teacher.

Optional - the behavior is chosen by the child, even if the activity is assigned by the teacher; any of the specific details of the activity (time, tools, materials, content, or form) are chosen by the child.

DETERMINING ASSIGNED LITERACY BEHAVIORS

Ask the classroom teacher these questions each day a subject is observed, to determine which literacy behaviors are assigned and which are optional.

Time_____ Date_____ Day#_____ Observer_____ Teacher_____

.. What do you call this part of the day?

..What specific writing activities must this child complete at _____? Is there a particular way the activity must be done? What materials must be used?

..What specific reading activities must this child complete at _____? Is there a particular way the activity must be done? What materials must be used?

..What specific manipulating activities must this child complete at _____? Is there a particular way the activity must be done? What materials must e used?

..What specific observing activities must this child complete at _____? Is there a particular way the activity must be done? What materials must be used?

..What specific discussion activities this child must complete at _____? times) Is there a particular way the activity must be done? What materials must be used?

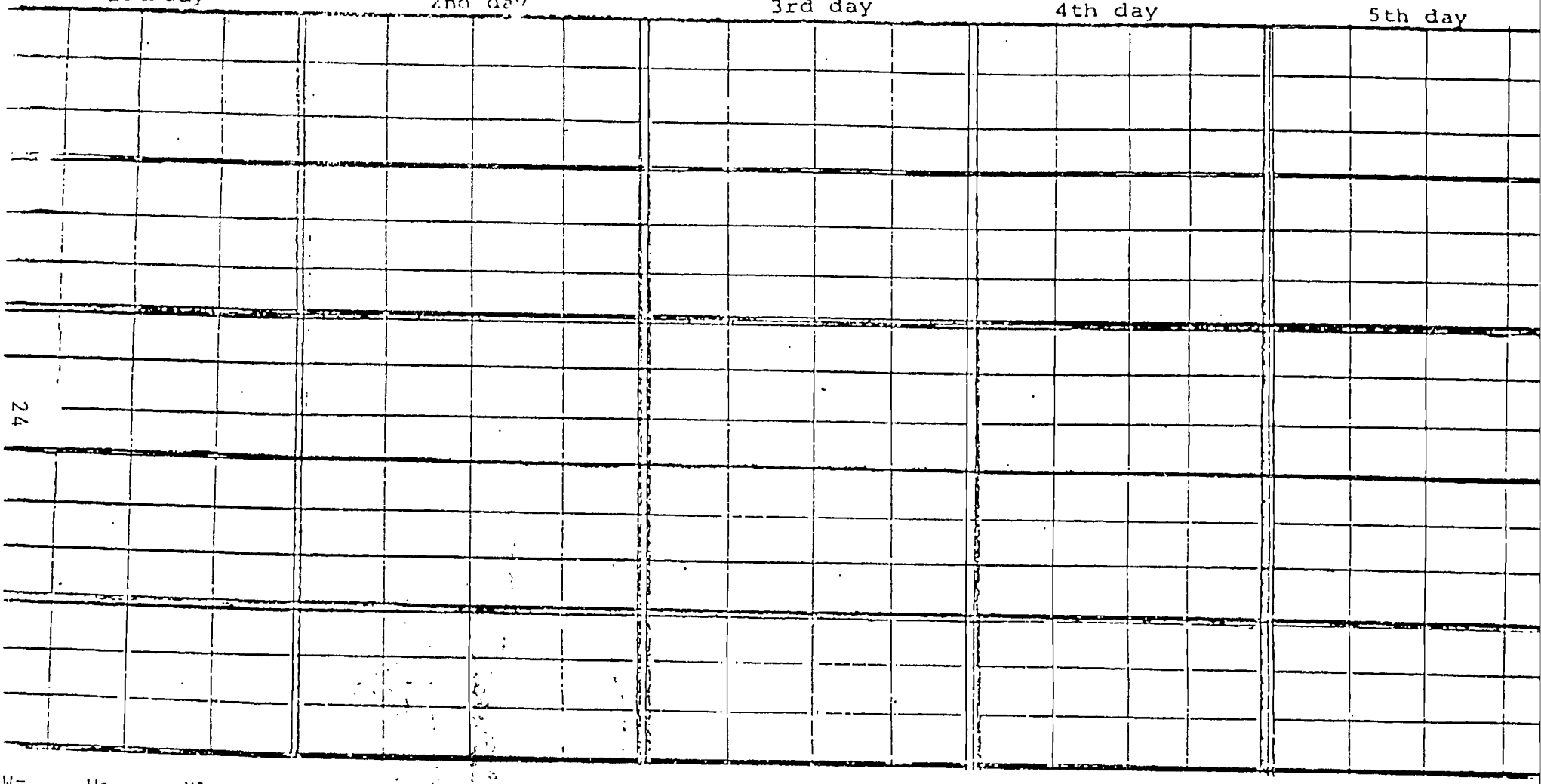
..What may the child do when his/her assignments are completed?

CHILD: _____ SCHOOL _____ WEEK OF _____

AGE _____ GRADE _____ TEACHER _____ DAY OF FIRST OBSERVATION: M T W TH F

SEX _____ RDG. INF. _____ YRS. TCHG _____ SEX _____ TIME BEGAN _____ TIME ENDED _____

OTHER _____ OTHER _____ OBSERVER _____



1st day	2nd day	3rd day	4th day	5th day
W= Wo= NA=	W= Wo= NA=	W= Wo= NA=	W= Wo= NA=	W= Wo= NA=
R= Ro= NL=	R= Ro= NL=	R= Ro= NL=	R= Ro= NL=	R= Ro= NL=
M= Mo= Tch	M= Mo= Tch	M= Mo= Tch	M= Mo= Tch	M= Mo= Tch
O= Oo= Mvd	O= Oo= Mvd	O= Oo= Mvd	O= Oo= Mvd	O= Oo= Mvd
D= Do=	D= Do=	D= Do=	D= Do=	D= Do=
S= So=	S= So=	S= So=	S= So=	S= So=

APPENDIX B

SURVEY OF DISPLAYED LITERACY STIMULI

May, 1986 Edition

SURVEY OF DISPLAYED LITERACY STIMULI

C. Loughlin, N. Cole
University of New Mexico
May, 1986

The Survey of Displayed Literacy Stimuli can help determine the level of stimuli and support for spontaneous literacy behaviors in a learning environment.

The Survey examines each area for information about the pattern of distribution of the literacy stimuli in the environment, and compares one area to another.

The Survey also shows the kinds of literacy stimuli offered within areas and within the whole environment.

HOW TO USE THE SURVEY

1. Look at the classroom

Make a sketch map of your classroom environment, showing its spatial organization. Divide the total into different areas, deciding boundaries, space and materials for each. Include all classroom space in these areas. List each area at the top of the survey record.

2. Survey one area at a time.

Enter an area and sit so you can see all displayed materials from child's eye level. Begin the examination with the category definitions beside the survey record. COUNT ONLY THOSE MATERIALS DISPLAYED AT CHILDREN'S EYE LEVEL OR BELOW. Complete the recording for all literacy stimuli categories in one area before moving to the next area.

3. Count One Category of Literacy Stimuli at a Time.

With the category definitions beside the survey record, count all visible literacy stimuli in a given category. Recheck the definitions for each category when you are ready to count.

Look first at the category, then examine the area for items that belong in that category. Remember, you are searching for items which fit in a category; you do not try to find a category for each item you see. Record the number of instances in one category by talley or numeral before going on to the next category. Remember that only displayed items, at a child's eye level or below, are counted.

4. Yes or No Categories

The last five categories on the survey are not counted. Recheck the category definition. Then examine the area for presence of the stimuli described, and record its presence or absence.

5. Total

To compare one area of the environment with another, total each column. This will show where the stimuli for literacy are in the entire environment.

To compare the relative emphasis on different categories of literacy stimuli, total the records across each row. This will show the variety of stimuli and support for literacy behaviors in the environment.

THE SURVEY OF DISPLAYED LITERACY STIMULI

Loughlin / Cole
University of New Mexico
May, 1986

Each item must be clearly visible, and within child's eye level/range. Definitions attached.

AREAS

DISPLAYED LITERACY STIMULI										Total by Category
Record Actual Count										
1. current child generated messages, labels, stories.										
2. messages about the current day										
3. displayed directions for activity.										
4. sign-on, sign-out charts or sheets.										
5. different kinds of books.										
6. different kinds of recording tools										
7. different kinds of recording materials.										
8. different references.										
9. print or writing segments related to nearby materials, objects, pictures.										
10. books related to nearby materials, objects, or pictures.										
11. community culture/language books or print segments.										
Record 1 or 0 (Yes or no)										
12. presence of empty display space.										
13. presence of display tools.										
14. presence of clearly legible displayed handwritten or machine print segments.										
15. presence of books with cover or page displayed.										
16. presence of functional labels.										
TOTAL PER AREA										

Date _____ Special Conditions _____

Number of areas surveyed _____

Classroom and Grade Level _____ Observer _____

THE SURVEY OF DISPLAYED LITERACY STIMULI

Loughlin/Cole
May, 1986

Each item must be clearly visible, and at child's eye level or below.

CATEGORY DEFINITIONS

1. Current child-generated messages, labels, stories: (less than five days old) These may be child written, or child dictated. Determined by dated material, or by asking. Groups of completed assignments displayed together are excluded. Items in this category may also be counted in other categories.

2. Messages about the current day: Schedules, assignments, notices, groupings, news, and announcments needed to work through the day. These are clearly related to events on the day of the survey.

3. Displayed directions for activities: Displayed tasks, cards or charts that give directions for activities or procedures that children can carry out independently. Labels that explain how to operate equipment or care for material are excluded.

4. Sign-on charts or sheets: Teacher- or child-prepared chart or sheet, clearly displayed, that calls for children to record information in print or symbol, or to sign names.

5. Different kinds of books: The number or different kinds of books available for children's access, displayed so they are clearly visible (i.e. trade, reference, child- made, magazines, etc.) The number of volumes is not counted.

6. Different kinds of recording tools: The number of different kinds of tools for children's use in recording events, ideas, information, (i.e. pencil, crayon, chalk, tape recorder, etc.) Duplicates in an area are not counted.

7. Different kinds of recording materials: The number of different kinds of materials for children to record upon (i.e. audio tape, stationary, chart paper, chalkboard, drawing paper, etc.) Duplicates in an area are not counted.

8. Different references: Lists, pictures, charts, or other information sources children may use as references to help with ongoing activities. A set of references (i.e. encyclopædia) stored together is counted as one reference. Single volumes places in different locations are counted. Duplicates in an area are not counted.

9. Print or writing segments related to nearby materials, objects, pictures: Print placed close to pictures or other materials, with the contents of the print or writing clearly related to those materials in some way. Labels are excluded. Children's illustrated stories are excluded, unless thay are related to other nearby materials.

10. Books related to nearby materials, objects, pictures: Books located in combination with other materials, objects or pictures, and whose contents are clearly related to those materials in some way.

11. Community culture/language books or print segments: Books and print segments written in children's home language, or reflecting home culture, in a fairly homogeneous linguistic/cultural community not ordinarily represented in educational materials.

12. Presence of empty display space: Empty space in the area which is clearly available for children to display their own work. This is not always labeled, and can be determined by indications that materials have been displayed there, by something already displayed but not using all the space, or by asking.

13. Presence of display tools: Visibly displayed tacks, tape, label blanks, and/or other tools children can use to display materials.

14. Presence of displayed, clear and legible handwritten or printed segments: Print and child or teacher writing, displayed on unpatterned background with empty space surrounding the print segment. Print or writing is large enough to be seen by children in the area.

15. Presence of books with cover or page displayed: Books in the area with the covers clearly visible, displayed or with a particular page clearly visible.

16. Presence of functional labels: Working labels on holders, cabinets, or equipment that gives information about contents, use, or procedures for use.

Summary Sheet

Observer_____ Date _____ Classroom _____ Grade/Age _____

AREAS

No. areas surveyed _____

No. areas with all 1-10 categories. _____

No. areas with all 12-16 categories _____

No. areas with category 11 _____

CATEGORIES

No. 1-11 categories in environment _____

No. 12-16 categories in environment _____

Functional Score

Categories:

2 _____
3 _____
4 _____
8 _____
16_____

T_____

Child-generated Score

Category:

1_____

Communication score

Categories:

1 _____
12_____
13_____
14_____

T_____

Variety Score

Categories:

5_____
6_____
7_____
8_____

T_____

Content Score

Categories:

9 _____
10_____
11_____

T_____

Book Use Score

Categories:

5 _____
10_____
15_____

T_____

TOTALS

Categories 1-11 score _____

Categories 12-16 score _____

LITERACY BEHAVIORS OF KINDERGARTEN-PRIMARY CHILDREN IN HIGH STIMULUS-LEVEL LITERACY ENVIRONMENTS

Part II: Environments and Literacy Behaviors

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TABLE OF CONTENTS

THE PILOT STUDY.....1

THE STUDY.....2

Description of Stages.....2

Subject-Classrooms.....3

Subjects.....3

General Procedures.....6

FINDINGS: ENVIRONMENTS.....8

Spatial Organization.....8

Literacy Stimulus Levels.....10

Stimulus Categories.....13

Patterns of Literacy Stimuli 15

Literacy Functions.....20

FINDINGS: ACCESS TO DISPLAYED LITERACY.....22

Access Data.....23

Categories of Literacy Stimulus Used.....24

Schedules, Transitions and Self-Selection.....25

Use of Specific Categories.....29

Furtive Literacy.....31

Literacy Stimuli and Social Interaction.....32

FINDINGS: LITERACY BEHAVIORS.....34

Literacy Behaviors for All Subjects.....35

Optional and Assigned Literacy Behaviors.....36

Literacy Behaviors for Full-Data Subjects.....42

Behaviors in High and Moderate Access Settings...43

Stimulus Level, Access and Literacy Behaviors.....47

Ranking Patterns.....48
Stimulus Level Ranks.....49
Access Rankings.....49
CONCLUSIONS.....51
Literacy Environments.....51
Access to the Literacy Environment.....52
Literacy Behaviors.....54
Summary.....55
SOME RECOMMENDATIONS.....58
REFERENCES.....58
APPENDIX A: Extended Data Tables.....59
APPENDIX B: Procedural Details.....64

LITERACY BEHAVIORS OF KINDERGARTEN-PRIMARY CHILDREN IN HIGH STIMULUS-LEVEL LITERACY ENVIRONMENTS

PART II: ENVIRONMENTS AND LITERACY BEHAVIORS

This descriptive study was designed to describe children's participation in literacy within classroom environments organized for the purpose of stimulating spontaneous literacy (Loughlin and Suina, 1982); it examines patterns of literacy behaviors in high level literacy environments with varying levels of access to the environment. The research builds upon previous study of the literacy content of classroom environments(Loughlin and Cole, 1987; Loughlin and Ivener, 1984). The study has two major purposes: a study of instrumentation (see Part I) and a description of literacy environments and children's literacy behaviors within them. Specific goals for the study of literacy environments and literacy behaviors follow:

1. Describe the characteristics of environments organized to promote literacy, in terms of level and kind of stimuli and in terms of access to those stimuli.

2. Describe the optional and assigned literacy behaviors of children in high-level literacy environments.

3. Examine literacy behaviors associated with different levels of access.

THE PILOT STUDY

A pilot study (Loughlin and Ivener, 1984) was carried out in two schools, using earlier editions of the three instruments (Survey, Inventory, and Matrix) in 22 classrooms with varying levels of literacy stimulus and of access. Data showed the uses

of displayed literacy stimuli somewhat higher during transitions or self-selection periods than other times of the day, and showed that not all categories of literacy stimuli displayed in the environments were actually used by children. Although the data on literacy behaviors was regarded quite tentatively, particularly in the distinction between chosen literacy behaviors and those assigned, it directed attention to further study of children's literacy behaviors in high stimulus level literacy environments, and the examination of access to displayed literacy.

THE STUDY

This study, conducted in each environment through the three stages summarized below, involved the study of classroom environments (subject-classrooms) and the observation of children's (subjects') literacy behaviors. Procedures within each environment covered a time span from one and one half to two weeks.

Description of Stages

STAGE I: The classroom environment is sketched and surveyed, using The Survey of Displayed Literacy Stimuli, and the literacy stimulus level is determined.

STAGE II: The use of materials identified through the Survey is observed in a full day's continuous scanning with the Inventory of Access:Displayed Literacy Stimuli, and the level of access is determined.

STAGE III: The literacy behaviors of randomly selected subjects are observed daily for five consecutive days through the Literacy Observation Matrix. Behaviors are categorized by type and also by the conditions of being assigned or optional, and each subject's observed behaviors are totaled for the week.

Subject-Classrooms

About twenty kindergarten and primary classrooms were nominated as high-level literacy classrooms by support professionals knowledgeable about environment. With agreement of principals and individual teachers, seventeen of those became subject-classrooms. Nine were housed in schools identified as low socio-economic level by school system targeting for Chapter I Reading and Language Programs. Slightly under half of the environments supported multi-age groups, some in single sized self-contained environments, and others in double-sized environments with teaching teams. Grade-level and approximate class size of the subject classrooms are shown on the following page.

Subjects

The subjects within the environments described above were randomly selected from complete class lists. Subjects and alternates were identified, and in consultation with teachers each team eliminated subjects with special schedules (i.e. half of each day out of the subject-classroom for special education) or frequent absences. Alternates were used if selected subjects were eliminated or absent on the first observation day.

CHARACTERISTICS OF SEVENTEEN SUBJECT-CLASSROOM GROUPS

Classroom	Number of Teachers	Grade Level	Number of Children for Inventory	Number of Subjects for Matrix	Chapter I Status* of School
K-1	1 +aide	K	19	9	No
K-2	1 +aide	K	15	5	Yes
K-3	1 +aide	K	22	5	No
K-4	1 +aide	K	21	8	Yes
F-1	1	1	20	6	Yes
F-2	1	1	21	5	Yes
F-3	1	1	22	10	No
F-4	1	1	19	6	Yes
S-1	1	2	19	10	No
M-1	1	1,2	20	10	Yes
M-2	2	1,2	39	9	Yes
M-3	1	1,2	20	8	Yes
M-4	1	1,2	19	10	No
M-5	1	1,2	20	10	No
M-6	2	1,2	32	4	Yes
M-7	2	1,2,3	43	14	No
M-8	1	3,4	23	9	No

*Determined by community socio-economic level

The number of subjects varied from one environment to another, as shown above, for several possible reasons. When class size was exceptionally large, the initial number of subjects selected was increased. Attendance patterns at different seasons of the year affected the number of lost subjects in particular environments, especially with younger children. In addition, over the eighteen month period of the study, it became clear that the number of lost subjects had been underestimated,

From the original pool of subjects and alternates, 140

From the original pool of subjects and alternates, 140 children were observed for four or more days, and the data for that group examined to characterize literacy behaviors in the seventeen high literacy environments as a whole. Complete data (five days of observation) was available for 126 children, and the data for that sub-group of subjects was used to highlight characteristics of literacy environments and literacy behavior by comparing some environments.

The subject-classrooms had not been randomly selected, so there was no opportunity to deliberately balance socio-economic characteristics (determined by the schools receiving or not receiving Chapter I program support); however 9 of the 17 schools (approximately 52%) were so designated. By the end of the data-gathering period approximately 30% of all subjects and of full-data subjects were from Chapter I schools. Data from the following table shows that about 57% of the subjects were male, and

SUBJECTS BY GRADE LEVELS

	All Subjects*						Full Data Subjects*					
	K	1st	2nd	3rd	4th	Tot	K	1st	2nd	3rd	4th	Tot
Male	14	32	26	5	3	80	10	30	24	5	3	72
Female	13	25	18	3	1	60	10	24	16	3	1	54
Total	27	57	44	8	4	140	20	54	40	8	4	126

*all subjects: data from four or more observation days available

*full data subjects: data from five observation days available

that approximately 41% were enrolled as first grade students, 31% as second grade, 19% as kindergarten, and 8% as third or fourth grade. However, the subject-classroom data shows 76 (54%) were housed in multi-age environments.

General Procedures

A team approach was used for all stages of data gathering in each environment, so that information gathered formally (through the instruments) and informally (through additional observations and conversations with the teachers) during each stage could be used in the next. All data gatherers were trained to use each instrument in classroom settings before the teams were established. Training continued until each person could use the instruments consistently, and felt comfortable with procedures and scoring.

Original procedures called for two people to begin Stage I (Survey of Literacy Stimuli) in each environment during an afternoon when children were not present. The same team was expected to carry out the Stage II (Inventory of Access) study of the environment on the following school day, then select subjects and establish the schedule for Stage III (observing children's behaviors with the Literacy Observation Matrix).

The team planned to return for Stage III on five consecutive days, observing each subject for five minutes daily. The observers established the observation schedule, with one person observing all children on a given day. Each day's observation took place during a different time segment, so the entire school

day was sampled during the week. Teachers were interviewed daily about assigned literacy behaviors, and were given opportunity to comment on environment, activities, events, or children's literacy, if they chose.

Additional procedures developed as the study progressed; a few problems, as well as new information not previously considered, began to emerge. The timing of data gathering did not always proceed as expected, for a variety of reasons related to the many schedules that had to fit together(i.e. a single environment was surveyed at different times, a team member who surveyed was replaced by another for The Inventory.)

In the early months of data gathering, subjects not present for four days of observation were completely lost from the study, so the teams began to arrange to return to the classrooms a sixth day to complete the observation series on previously absent subjects; on occasion a third observer would assist by returning for the missing observations.

Some subject-classrooms were double-sized settings, with two teachers working together in space ordinarily used for two separate environments and groups; the number of students was much larger than in single, self-contained classrooms. This required some adaptation of procedures for using and scoring The Survey of Displayed Literacy Stimuli and The Inventory of Access (i.e. each team member sketching half of the environment for the Survey; dividing the class into to groups and scanning one half group at a time for the Inventory.) Detailed directions for the

use of the instruments and procedures used for each stage are available in the Appendix B of Part II.

As each research team used the instruments to describe the environments, to examine access to literacy, and to observe children's literacy behaviors, they noticed many events which were not captured by the instruments, and began to note them on the margins and backs of the recording forms. This data, and records of team discussions which followed the three stages in the classrooms, later became part of the findings of the study, complementing the numerical data and enlarging the descriptions of environments and children's behaviors.

FINDINGS: ENVIRONMENTS

The instrument data and the informal, and focused, observations in the subject-classroom environments are both significant in providing a description of literacy behaviors in high stimulus level environments. The instrument data offers specific information about the level of stimulus for literacy, and the extent to which children respond to those suggestions. The informal observations describe the events, assignments, schedules and settings related to children's behaviors, expanding the descriptions offered through the instruments.

Spatial Organization

Sketch maps of environments show some commonalities in spatial organization of high-literacy subject-classrooms.

SPATIAL ORGANIZATION IN SEVENTEEN LITERACY ENVIRONMENTS

Class Level	Tchr.Estab. Areas	Areas Surveyed	Survey Areas with Disp.Sp.	Seating Furniture
Kindergartens				
K-1	11	9	5	dispersed
K-2	8	6	6	dispersed
K-3	8	7	7	dispersed
K-4	8	8	8	dispersed
First Grades				
F-1	7	6	5	together
F-2	10	6	3	dispersed
F-3	11	6	5	dispersed
F-4	10	8	3	dispersed
Second Grades				
S-1	9	7	6	dispersed
Multi-Age Single Space				
M-1	10	5	2	dispersed
M-3	8	6	3	dispersed
M-4	8	5	3	together
M-5	8	6	4	together
M-8	9	5	5	together
Multi-Age Double Space				
M-2	12	6	6	dispersed
M-6	15	9	9	dispersed
M-7	13	10	8	dispersed

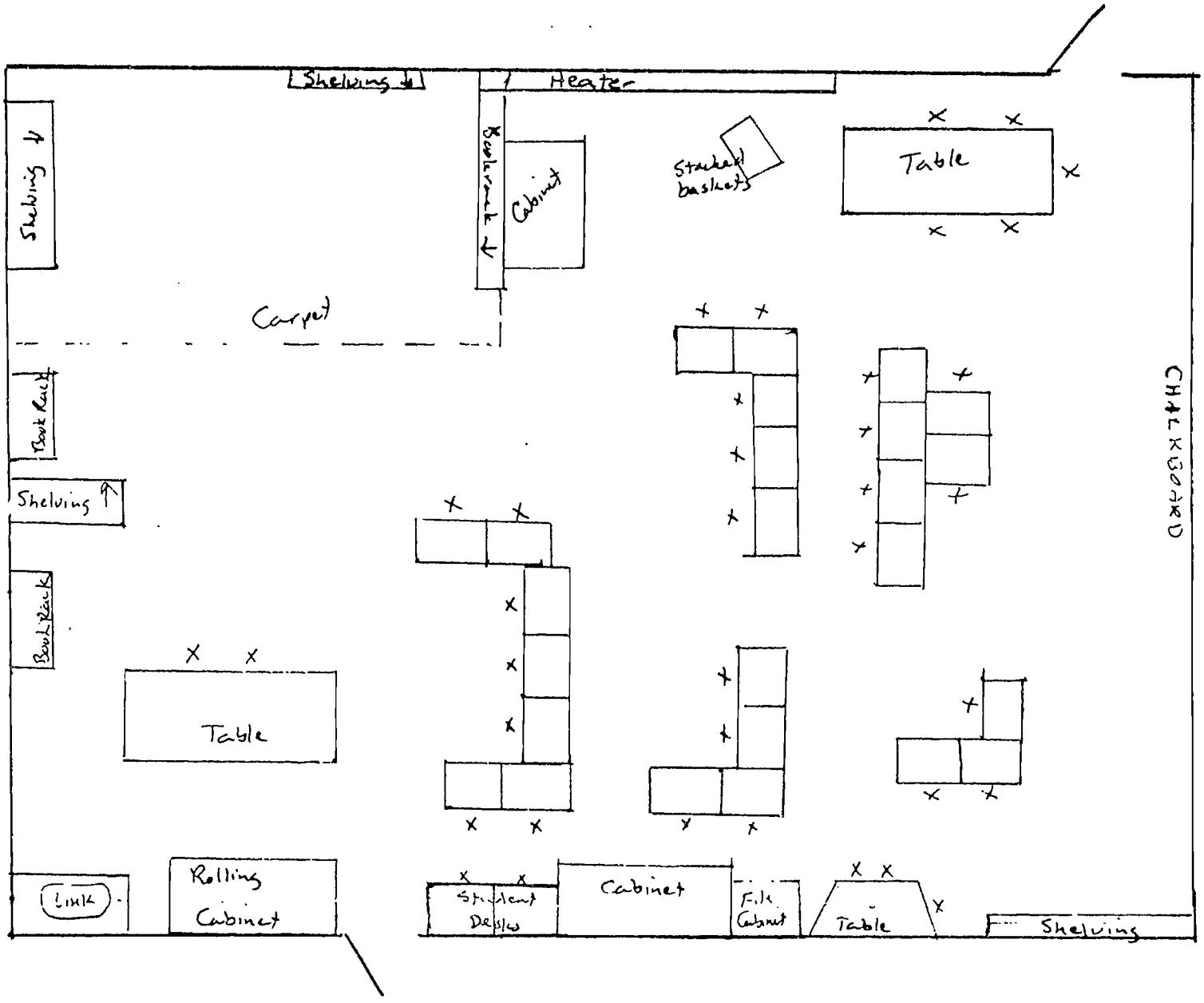
Each environment was subdivided into several smaller areas by furniture arrangement. Shelving units, standing display boards, book racks, room dividers, and large pieces of furniture (i.e. pianos, tall cabinets) were placed to define the smaller

spaces and provide materials for use in those areas. The number of areas ranged from 7, in a self-contained first grade, to 15 in a double-sized multi-age classroom. In all but one environment the backs and sides of much of the space-dividing furniture were made available for display space.

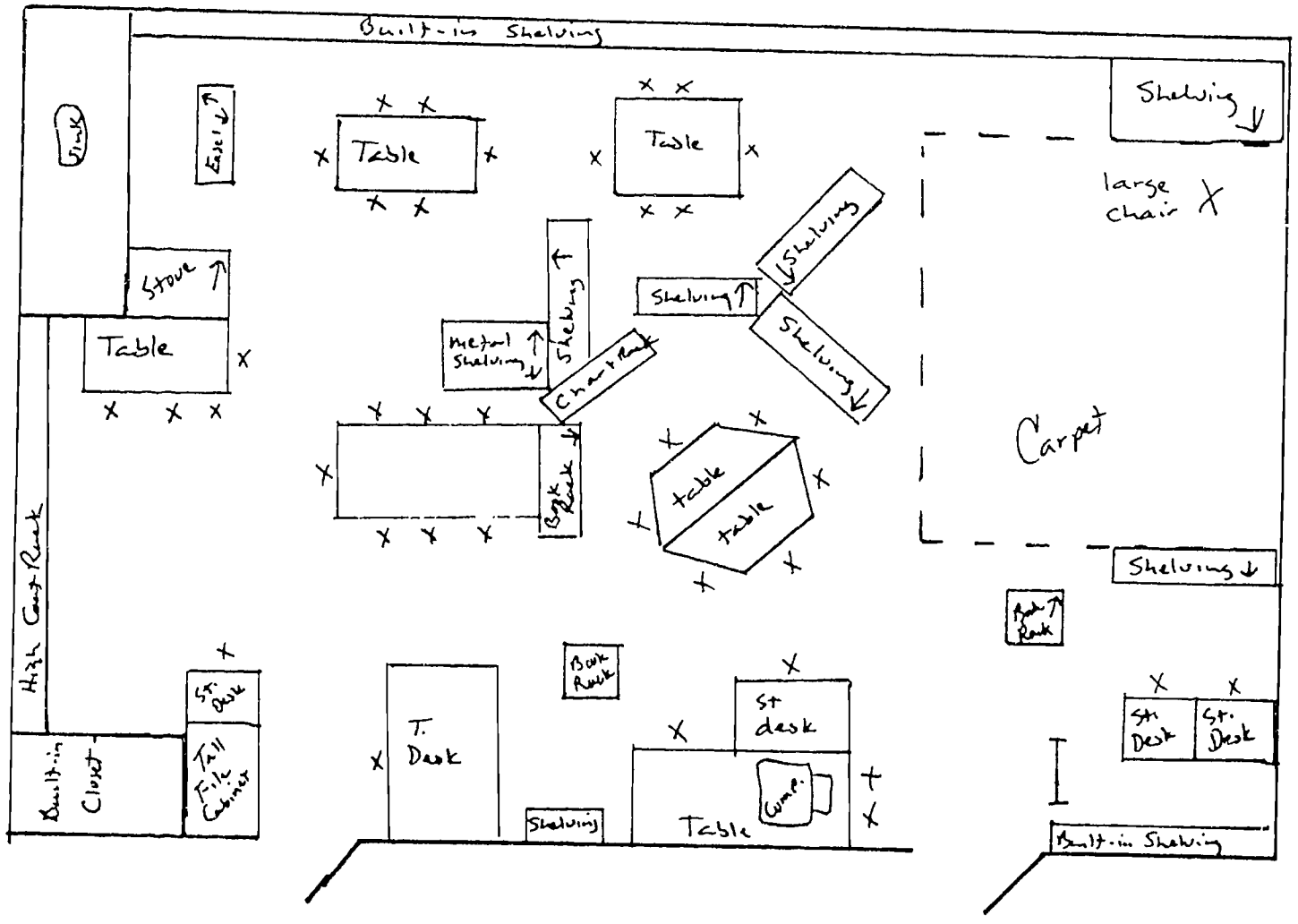
The environments varied in the sizes of the arranged areas, although there was no systematic pattern by size of class or size of environment. Thirteen environments showed complex arrangements, with clear, but not necessarily central, paths through the environment which dispersed seating furniture into the areas; the others had simpler arrangements, with a large somewhat central area for most of the seating furniture, and the remaining space subdivided (4 environments). Two subject-classroom floor plans are shown on the following pages as examples.

Literacy stimulus levels

The index used to examine the level of literacy stimulus among subject-classroom environments was the Total Number of Stimuli in Counted Categories on The Survey. On this basis, the stimulus level within the seventeen environments ranged from a Counted Total of 45 to a Counted Total of 223, with 17% of the environments falling below a Counted Total of 90. (In contrast, the range found in the recoded pilot study data was 23 - 240, with 47% falling below 90.) Complete data on Counted and Uncounted Displayed Literacy Stimuli appear in Appendix A.



ENVIRONMENT F-1



ENVIRONMENT F-4

Stimulus Categories

The Survey of Displayed Literacy Stimuli (presented in Part I of this report) identifies 11 categories of materials and arrangements which are counted in each area surveyed; five additional categories are noted as present or not present in each area rather than counted.

In the counted group, as shown in the following table, the category with the highest count across all the environments is kinds of recording tools. The counts for this category varied from 8 to 36, (see Appendix A,Part II) but all environments were well provisioned with recording materials. It should be noted here that the kinds of recording tools in each area were counted,

RANKING AND TOTAL REPRESENTATION OF LITERACY STIMULUS COUNTED CATEGORIES IN SEVENTEEN ENVIRONMENTS

CATEGORIES	Rank	Total for All Environments
Kinds Recording Tools	1	338
Child Written Message	2	310
Kinds Recording Material	3	305
Kinds References	4	304
Print Related to Objects	5	227
Kinds of Books	6	210
Books Related to Objects	7	140
Message Current Day	8	110
Sign-up/sign-on charts	9	86
Displayed Directions	10	79
Community Lang/Culture	11	19

rather than the total number; scores for this category (and several others) represent both variety and distribution, since the number of types in each area were totaled, regardless of duplication of kind across different areas.(Loughlin and Martin, 1987)

Child-written messages were the second most frequently counted literacy stimuli across all environments, and were the category researchers noticed and teachers commented upon most often in the informal data. Individual child-written messages were found in areas which offered empty display space. They appeared to be primarily social (i.e."I love you, Mrs. XX" or "Clean your desk, Carlos!") and sometimes functional (i.e. "Put Current Events Here"). Where children's writings were displayed by teachers, it tended to reflect common content (i.e. seasonal and study themes), even when child initiated and individual.

Different references ranked fourth of the counted categories. The definition for references was established in a broad sense (see The Survey Definitions, Appendix A, Part I), including word lists and charts about print conventions, or other information which children could use to carry out their activities; these were identified and counted during the survey after the school day was over. However, in later stages, the data gatherers saw many other materials pressed into service as references. Generally, they agreed, children used any print they could consult as a reference for spelling, letter form and punctuation (i.e. child written messages, nutrition charts, messages about the current

day, functional labels, captions on commercial illustrations). The count for the category different references reflects teacher-planned variety and distribution, but probably under-represents the available reference material in most of the high-literacy environments.

The lowest frequency was seen in the category community culture/language books or print, with total counts in classrooms ranging from 0 (in more than half of the environments)to 4. Observers commented that the few teachers in this study who did share language and culture with their children of minority communities in other ways did not necessarily reflect these in the environment; some teachers whose primary language and culture was different from their students' spoke of a need to reflect the community's life, but felt they lacked the personal and material resources to do that.

Patterns of Literacy Stimuli

Because of the number of multi-age groups housed in the environments studied, it is not possible to examine all the survey data by grade level; however it is interesting to see what patterns of literacy stimulus may exist in classrooms of similar level(s). In the following table, the counted category figures have been averaged for each group of classrooms housing children of the same level(s). However, data for three of the groups (grade 2; grades 1,2,3; and grades 3,4) represent only one classroom at each level, since there was only one among the subject-classrooms.

Of the single-level self-contained classrooms (K,1,and 2), kindergartens tended to show almost twice as many child-written messages as the others; however in three of the four kindergarten

AVERAGE NUMBER OF STIMULI* PER CLASSROOM
IN EACH COUNTED CATEGORY, BY GRADE LEVEL

CATEGORIES	K	1	2	1,2	1,2,3	3,4
Message Current Day	6	6	4	6	17	1
Child Written Message	27	14	6	15	48	14
Print Related to Objects	14	6	7	15	18	30
Books Related to Objects	13	6	1	7	17	3
Kinds of Books	10	11	10	13	24	9
Kinds Recording Tools	16	15	25	23	36	9
Kinds Recording Material	21	14	16	20	24	4
Kinds References	13	14	19	22	27	19
Displayed Directions	6	7	1	4	2	10
Sign-up/sign-on charts	7	2	10	4	8	2
Community Lang/Culture	1	1	0	1	2	4

*Averages are rounded figures

environments two groups of children used the environment daily, which could account for the larger number. (Class sizes shown on page 9 represent the number of children present at the time of The Inventory of Access and does not include the second kindergarten group.) The figure of 48 child-written messages shown for the 1,2,3, level also stand out as markedly different from other multi-age classrooms. However, this data represents one environ-

ment, with a double sized class group which may also affect apparent differences.

In the following table, to examine some patterns by class size and environment size, as well as level of classrooms, the data has been averaged for groups of the same level and again for multi-age groups of single and of double class size and group size.

AVERAGE* DLS IN EACH COUNTED CATEGORY
IN GROUPS OF ENVIRONMENTS

Groups	Mcd	Cwm	Pro	Bro	Kbk	Krt	Krm	Krf	Dir	S/u	Com	AV DLS
Kindergartens (4)	6	27	14	13	10	16	21	13	6	7	1	135
First Grades (4)	6	14	6	6	11	15	14	14	4	2	1	97
Second Grades (1)	6	4	7	1	10	25	16	19	1	10	0	99
Multi-age 1,2 (6)	6	15	15	7	13	23	20	22	4	4	1	130
Multi-age 1,2,3 (1)	17	48	18	17	24	36	24	27	2	8	2	233
Multi-age 3,4 (1)	1	4	27	3	9	9	4	19	10	2	4	92
Multi-age Single(5)	5	11	18	6	9	19	15	22	5	4	1	114
Multi-age Double(3)	9	28	15	11	23	31	25	24	3	5	2	178

*Averages have been rounded

The data show the average stimulus level (counted category total) for kindergartens about 1/3 higher than for self-contained grades 1 and 2. Multi-age levels 1,2 and 3,4 show a lower level than the 1,2,3 level. It important to remember, however, that the grade 2 and the 1,2,3, level data each represent just one environment.

When the multi-age environments are grouped by single and double-sized classrooms, the data show more displayed literacy stimuli in the larger environments; it appears that more space provides more places to arrange literacy stimuli. The spatial organization table on page 9 shows an average of 7.7 areas containing empty display space in each double environment, compared to 3.4 in the single environments. The child-written message data reveals an additional source of the larger number of stimuli; displayed child-written messages are encouraged by available display space. Children in the double classrooms have produced about 15% of displayed literacy stimuli, compared to about 9% in the single classroom multi-age environments.

The comparison between single and double-classroom groups and spaces makes it interesting to look at patterns between the number of surveyed areas showing empty display space (see page 9) and the displayed literacy stimuli of each group. A summary is shown on the following page.

The environments used by the largest numbers of children (kindergarten double-group and multi-age double-group) show more surveyed areas with display space than other groups. They also showed, on the average, more child-written messages, more books related to objects , and more kinds of recording materials.

In comparison, the group of environments with the largest amount of space (multi-age double space) show higher counts than all other groups in 5 categories. However, four of these higher-count categories (different kinds of books, different kinds of

recording tools, different kinds of recording materials, different references) describe both variety and distribution, and the count is affected by the number of areas surveyed. (See directions and definitions for The Survey in Appendix A, Part I.) The double-

AVERAGE COUNTED CATEGORY TOTAL
IN SINGLE AND DOUBLE-SIZED
GROUPS AND SPACE

CATEGORIES	Multi-age Single Space Single Group	K,1,or2 Single Space Single Group	Kdgn Single Space Double Group	Multi-age Double Space Double Group
SURVEYED AREAS W/DISPLAY	3.6	5.6	6.3	6.3
Message Current Day	5.4	6.2	5.6	9.3*
Child Written Message	11.4	18.7	35.0#	21.3
Print Related to Objects	18.2	10.1	15.3	15.0
Books Related to Objects	5.6	8.5	13.6#	11.3
Kinds of Books	8.6	11.0	9.3	22.6*
Kinds Recording Tools	18.8	14.1	16.3	30.6*
Kinds Recording Material	15.6	17.4	24.0#	25.0*
Kinds References	21.6	13.8	10.0	23.6*
Displayed Directions	5.0	7.5	6.0	3.0
Sign-up/sign-on charts	4.0	5.6	6.6	5.0
Comm. Culture/Language	1.0	1.0	1.3	1.6
COUNTED CATEGORY TOTAL	114.2	114.5	114.5	175.3

categories higher in all double-group environments

* categories higher in all double-space environments

space environments showed an average of 7.6 areas surveyed, while all single-space environments showed an average of 6.4.

Literacy Functions

Groups of literacy stimuli have been identified as associated with particular functions of the literacy environment (Loughlin and Martin, 1987):

Functional Use Group: current day messages; displayed directions; sign-up sheets; different references; functional labels

Child-generated Group: current child-written messages

Communication Group: child-written messages; display space; display tools; clearly legible displayed print

Variety Group: kinds of books; kinds of recording tools; kinds of recording materials; different references

Content Group: print related to nearby objects; books related to nearby objects; community language/culture print

Book Use Group: kinds of books; books related to nearby objects; books with cover displayed

It is important to remember that three of the function groups include both counted and uncounted stimulus categories, but three do not, so the scores are not comparable. The uncounted stimuli totals are recorded in each area as 1, if present, or 0, if not present (see Appendix A, Part I) so the environment totals for these are dependent on the number of areas surveyed. Function scores can show whether a particular function is supported. Direct comparisons among function scores within an environment are not meaningful because of the combined data, although a rough comparison of one environment to another can be made.

The following table shows function scores in all environments, from the smallest range of 7-49 for book use scores to the wider range of 40-111 for variety. Double-group classrooms(three

multi-age and three kindergarten) accounted for the single highest score for all six functions; a single double-space environment produced the highest scores for the functional, communication, variety, and book use groups. It is interesting to note that

LITERACY STIMULUS FUNCTION SCORES
IN SEVENTEEN ENVIRONMENTS

	K1	K2	K3	K4	F1	F2	F3	F4	S1	M1	M2	M3	M4	M5	M6	M7	M8
FUNCTION GROUP																	
Functional	44	11	51	47	32	40	21	39	43	54	47	32	40	42	40	64	37
Ch.Written	49	8	3	48	4	6	13	34	4	11	14	15	20	7	22	48	4
Communication	65	22	22	67	15	20	29	48	19	22	36	35	31	17	48	73	15
Variety	96	27	62	56	40	57	57	68	70	80	101	76	67	54	94	111	41
Content	36	5	25	50	8	23	7	16	8	16	22	9	35	30	25	37	34
Book Use	38	7	32	40	13	30	19	30	14	17	36	17	28	15	41	49	15

when the three highest scores for each function are identified, they are found in just six classrooms. All except one of those eighteen scores occur within kindergarten or multi-age groups; this may reflect teacher style or program style, but data on these are not available.

The function scores do not seem to show a pattern in terms of grade level; however the number of students using the environment and the physical size of the environment may be connected with those scores. Double-group environments produced sixteen of the eighteen scores representing the three highest environments on each function. The apparent pattern of double-space environments

showing the highest level of support for five of the six functions depends on data from a single classroom, which also has the highest Counted Category Total on The Survey. This may reflect other program characteristics or the teachers' "organization for special purposes" (Loughlin and Suina, 1982; Loughlin and Martin, 1987) as much as it reflects the double space.

FINDINGS: ACCESS TO DISPLAYED LITERACY

The access data was obtained through The Inventory of Access: Displayed Literacy Stimuli, by two researchers who spent a full day in the subject-classroom, conducting continuous group scans (looking at each child in turn) and recording which displayed literacy stimuli identified in Stage I were used. Because the team alternated, one member completing a scan and the other immediately beginning the next, there was also time for more open-ended observation between scans. Data gathering procedures for the study had not called for the open observations, so at first team members exchanged information only with each other. As the study progressed, and the teams met together to exchange information about their experiences, it became evident that a full day in the classroom offered more insights about children's access to displayed literacy than was available from The Inventory alone. Information from discussion notes and comments on the inventory records has contributed to the findings presented here.

Access Data

Access is operationally defined as the extent to which children use displayed literacy stimuli. The Inventory of Access provides a running record of the surveyed materials being used by children in the environment throughout one school day. Complete use and access data for all environments can be found in Appendix A of Part II.

BASIC ACCESS DATA FOR SEVENTEEN ENVIRONMENTS

	Survey Score	Access Score	Access Rank *	Class Size #	Env't Space	DLS cat. present	DLS cat. Used
K-1	202	.37	13	19	single	13	11
K-2	45	.15	17	15	single	13	6
K-3	113	.49	7	22	single	13	8
K-4	183	.35	14	21	single	14	8
F-1	64	.18	16	20	single	14	9
F-2	102	.48	8	21	single	13	9
F-3	89	.40	11	22	single	13	10
F-4	134	.69	2	19	single	14	9
S-1	99	.61	5	19	single	13	10
M-1	128	.56	6	20	single	13	11
M-2	146	.69	2	39	double	13	10
M-3	112	.46	9	20	single	13	11
M-4	133	.35	14	19	single	13	9
M-5	106	.38	12	20	single	14	11
M-6	157	1.24	1	32	double	14	12
M-7	223	.66	4	43	double	14	12
M-8	92	.43	10	23	single	14	9

*Environments with the same access/child score are assigned the same rank.

#The number of children present on the day The Inventory of Access was used.

The index used to determine Access with the instrument is ordinarily The Number of Uses per Scan; however because of the wide differences in class size among the seventeen environments, the index used for this study was Access per Child (number of uses per scan divided by the number of children present.) The preceding table presents basic access data for all environments, and includes the score from The Survey of Displayed Literacy for each.

The access/child scores range from a low of .15 to a high of 1.24 and can be used to rank the environments in terms of access to displayed literacy. The rankings show all three double-sized classrooms (which are also multi-age classrooms) and a single-sized first grade among the four highest ranks, while the lowest ranks include kindergarten, first grade, and multi-age environments.

Categories of Literacy Stimulus Used

Fourteen possible categories of displayed literacy stimuli can be identified through The Inventory (three of the counted and uncounted Survey categories are collapsed into one for this instrument). The data shows seven environments (one kindergarten, two first grades, and four multi-age) in which each category is represented. All others show thirteen categories present.

When the number of categories present is compared with the number of categories recorded in use, however, the environments look somewhat different. There were no environments where all categories present were observed in use on the day of the access

observations, and the gap between stimuli present and those in use ranges from 2 to 7 unused categories.

As the preceding table shows, neither the number of categories present, nor the number of unused categories necessarily followed the environment's ranking on access/child. The six environments showing all fourteen categories present ranked 1st, 2nd, 4th, 10th, 14th, and 16th; and the five environments where all except two categories were recorded in use varied in access, ranking as 1st, 4th, 6th, 9th, and 13th.

Schedules, Transitions, and Self-Selection

The narrative data from the days of the access observations offer some insight to this gap. For instance, in the environment showing the lowest access level, the classroom teacher was unexpectedly absent. The classroom day, which ordinarily provided large time blocks of self-selection and open-ended activities, was changed to meet the teaching style of the substitute, who actively prevented children from gaining access to the environment's provisions, including most of the literacy stimuli. The observers thought the 72 uses of 6 categories of displayed literacy stimuli recorded on the inventory were a tribute to the persistance of the children in responding to literacy stimuli.

The persistance of children's interest in literacy and their response to displayed literacy stimuli was observed in other settings, also. The the externally determined schedule (i.e. leaving the environment for scheduled classes, having special

short, discrete time blocks (15 -40 minutes) even when teachers would have chosen otherwise. As a result, many obligations for teacher assigned or directed activity occurred during the time segments in the environment, keeping children away from the environment's provisions. However, such schedules also provided a large number of transitions, when children made rapid use of the literacy stimuli. One observer described children "running for the literacy materials, as though they had to use them quickly, while there was a chance." A weekly schedule of external events for a single-sized classroom in such a school shows:

Library:	Monday and Thursday, 1:30-2:00
Music:	Thursday, 10:00-10:30
P.E.:	Monday and Friday, 11:05-11:35
Spanish:	Monday and Wednesday, 9:20-9:40
Counselor:	Tuesday, 9:15-9:25
Computer Room:	Tuesday and Friday, 10:50-11:20
	Thursday, 9:15-9:45
Recess:	Daily, 10:30-10:45
Lunch:	Daily, 11:35-12:30

The teacher in this classroom worked to arrange time for children's access to the environment's literacy stimuli; the inventory data shows 219 uses during the day's observation, although the environment ranked fourteenth in access, with a score of .35 for access/child.

On the other hand, there were environments where teachers were less constrained by external schedules, and were able to arrange long time blocks several days each week, with much less external scheduling. A half-day kindergarten schedule (displayed and used as a literacy stimulus) provides a good example:

external scheduling. A half-day kindergarten schedule (displayed and used as a literacy stimulus) provides a good example:

Morning Message and Group Time
Committees
Recess
Story time
Self-Selection
Clean-Up
Group Time
Lunch
Home

Transitions are fewer with a schedule like this, and observers in several classrooms of this style reported that children seemed to move into new locations and activities without any teacher announcements (the observers were sometimes unaware of transitions until the children were almost through them). Uses of displayed literacy stimuli occurred through the day, as well as during transitions.

Self-selection time blocks occurred in all of the kindergarten environments and in several of the primary classrooms. The displayed literacy stimuli appeared to receive considerable use during self-selection, when children were free to make use of the environment's resources for self directed activities. When the data is examined to compare the proportion of scans which included self-selection and transitions to the number of uses which occurred within self-selection and transitions, some interesting patterns occur. Transitions occur in all environments, and self-selection in a much larger proportion of this group of high-literacy classrooms than would be seen in randomly selected kindergarten-primary classrocms.

The following table page shows 29% of recorded uses in all environments occurring during transitions, somewhat higher than the 26% of the scans in transitions would suggest. In

PERCENTAGE* OF SCANS AND PERCENTAGE OF USES OF DLS DURING TRANSITIONS AND SELF SELECTION IN SUBJECT-CLASSROOMS

	Total Uses	%Scans Trans.	%Uses Trans.	%Scans S.Sel.	%Uses S.Sel.
Rooms					
K-1	191	30%	04%	30%	34% *
K-2	72	16%	29% *	38%	24%
K-3	173	61.%	38%	25%	25%
K-4	73	1%	5% *	70%	93% *
F-1	118	34%	45% *	-	-
F-2	285	18%	26% *	14%	10%
F-3	289	-	-	-	-
F-4	263	8%	6%	7%	4%
S-1	361	52%	47%	6%	11%
M-1	389	31%	29%	94%	10%
M-2	508	21%	19%	16%	17% *
M-3	248	48%	44%	15%	18% *
M-4	219	33%	34% *	6%	13% *
M-5	204	76%	4%	15%	15%
M-6	317	63%	57%	38%	31%
M-7	370	38%	32%	23%	18%
M-8	88	-	-	-	-
All Rooms	3879	26%	29%	22%	17%

* Proportion of uses during these scans higher than proportion of these scans in total scans
- Data not available

five environments, the percentage of uses during transitions was greater than the percentage of scans during transitions. Two of those environments, and three others as well, show a higher

proportion during self-selection than the percentage of scans in self-selection would suggest.

Use of Specific Categories

The relative frequency of uses for specific categories of displayed literacy stimuli show some interesting patterns of

RECORDED USES OF DISPLAYED LITERACY STIMULI
IN ALL ENVIRONMENTS

Stimuli	Survey Score	Times Used	% of all Uses	Rank
Message current day	110	170	4%	4
Child written message	310	166	4%	5
Print related to object	227	94	2%	8
Book	441	1015	24%	2
Recording tool	338	1249	29%	1
Recording material	305	987	24%	3
Reference	304	140	3%	6
Displayed directions	79	43	1%	11
Sign-up/sign-out	86	92	2%	9
Community culture/lang	19	0	0%	14
Display space	91	3	0%	13
Display tool	59	36	0.8%	12
Functional Label	105	51	1%	10
Displayed legible print	114	122	3%	7
Total	2588	4168		

* percentages have been rounded

use during a day in all the environments. Three categories were markedly higher in frequency of use than all others: recording tools, books, and recording materials. However the complete Use

and Access Data in Appendix A of Part II show a range of uses of those three categories among individual environments. Recording tool use ranged from 5 to 203, book use from 10 to 122, and recording material use from 1 to 144.

The highest frequency of use for each of these three categories occurred in a single environment; in this classroom the schedule consisted of short, discrete time segments with many externally scheduled events, as shown on page 26. Observers in this and other environments with similar schedules noted that when recording tools and materials were displayed in areas, those displayed materials were used in teacher assigned activities, as were references, but were then functioning as a support rather than a stimulus for literacy activities.

Books, on the other hand, appeared to stimulate their own use, especially when displayed with related objects and with covers showing. Some teachers whose external schedules demanded assigned activities while children were in the environment arranged to incorporate a variety of books, and offered choice in these and other literacy materials within those activities.

The lowest use frequencies are found in the categories of community culture/language print or books, display space, and display tools. Observers commented on the number of individual child-written messages identified during Stage I, yet the display tools and display space used to display those individual messages ranked 12th and 13th in frequency of use. The child-written messages ranked 5th in frequency of use, and was markedly lower

(with a frequency of 166) than the third ranking recording materials (987).

The data shows no uses of any community culture/language materials, a category which also showed the lowest count in the Survey of Stage I. This finding is quite different from those of a previous study with earlier versions of the Survey and Inventory instruments. Observations of that study (which occurred in a fairly homogeneous rural minority community) had shown enough uses of such materials that it seemed necessary to add the category to both Survey and Inventory.

Furtive Literacy

Observers noted many furtive uses of books in some environments at times when it was not a legitimate activity. Children were often seen handling or leafing through books from a nearby rack during large-group sessions; they were sometimes scolded for this. In one environment, each child had just chosen and been given a book to keep when a special teacher, not knowing this, came in and insisted on empty hands and complete attention to a long set of directions. Children stroked the books in their desks, pulled them onto their laps, tried to show pages to one another. Despite frequent reprimands, the books were used, hidden from the teacher, throughout the lesson.

Recording tools and materials were seen being used in furtive literacy activity. Children wrote and sent notes, collected names, wrote messages to take home. There is no counted data on furtive uses of literacy stimuli; however much of it was seen in

environments with limited time for self-directed work. It tended to involve books, recording tools and recording materials; and a large proportion of it was social (directed toward or carried out with peers).

Literacy Stimuli and Social Interaction

The data on the social context for uses of displayed literacy stimuli is incomplete, but the limited records are interesting. Observers' informal comments noted many uses of displayed literacy stimuli in social settings with peers; "Sustained Silent Reading" appeared social rather than silent, collaboration was a frequent part of the use of recording tools and materials, and children read schedule and other daily information to each other.

However the available data from the inventory records do not reflect peer settings as the norm. The table on the following page shows more uses occurring with no social interaction, followed by the combined peer interaction settings (1072 uses with peer interaction), and uses with teacher interaction least frequently recorded. Further data on individual environments, showing categories of stimuli and the social settings of their specific use might clarify this mixed data, but it is not available at this time.

The access findings are complex. With the instrument classrooms can be ranked by their access scores, but the unstructured observations of the researchers appear to provide somewhat different information. The observers do not suggest the access data completely contradict the informal observations; they do

imply that there are several dimensions of access, and not all of them are reflected in the access picture of the inventory.

USES OF DISPLAYED LITERACY STIMULI
AND THEIR SOCIAL SETTINGS

	Social Settings			
Rooms	Tchr	Child	Child'n	Nsi
K-1	43	27	49	51
K-2	28	12	31	30
K-3	60	36	6	70
K-4	16	5	8	31
F-1	31	33	23	64
F-2	68	63	24	127
F-3	61	44	0	144
F-4	79	43	12	99
S-1	37	74	37	155
M-1	101	30	37	147
M-2	80	75	30	209
M-3	25	51	36	79
M-4	11	42	45	83
M-5	75	25	19	83
M-6	106	41	6	105
M-7	51	64	38	100
M-8	10	6	0	52
Totals	882	671	401	1629
Peer Interaction		[1072]		

Tchr: with teacher
Child: with one child
Child'n: with more than one child
Nsi: no social interaction

For the current study, however, the access/child scores and the rankings related to them, will be used to distinguish between the high access group (the four highest ranked environments) and a moderate access group (the four lowest ranked environments). The term moderate is used because none of the environments studied

appear to be low in access, when compared to classrooms in general.

FINDINGS: LITERACY BEHAVIORS

The definitions of the six literacy behaviors recorded on the Matrix record were:

> Writing - the act of recording messages in some form using some kind of recording tool and material; the act may range from recording a check mark on a graph to writing an essay.
>
> Reading - the act of visually attending to print or symbols with or without vocalization; the act may range from fixating on whole texts or upon shortened temporary messages, signs, letters, pictures, but the materials must be within 5 feet of the child.
>
> Manipulating - the act of readying tools and materials for use, drawing or constructing, turning pages, sharpening pencils, stapling, gluing, cutting, erasing, and/or folding.
>
> Observing - the act of visually attending to a peer or adult writing, reading, or manipulating (as defined above) with or without vocalization and physical contact.
>
> Discussing - the act of talking with another person while holding literacy materials, or to a person who is holding literacy materials but not writing, reading, manipulating or observing.
>
> Scanning - the act of looking toward displayed literacy materials more than 5 feet away, while in direct contact with other literacy materials.

Each of the literacy behaviors above is further coded as assigned or optional, as defined below:

> Assigned - the behavior is required within an activity and must be done at a particular time designated by the teacher.
>
> Optional - the behavior is chosen by the child, even if the activity is assigned by the teacher; any of the

Two additional behavior categories account for behaviors not categorized as literacy behavior:

No Literacy Action - acts not handling a literacy material or visually attending to a literacy material; this includes standing and waiting for a turn, sitting idle, hiding, resting, whistling, talking in the absence of contact with literacy materials, gazing at the teacher or peers more than 5 feet away, looking into another room or out a window.

Not Located - the child is present but not visible to the observer during the spot observation period, or has left the environment.

Literacy Behaviors for All Subjects

Literacy behavior data for four or more days are available for 140 subjects in grades K-3. (Subject characteristics are described on page 5.) Examination of the data, summarized below, shows interesting patterns related to the question: What kinds of optional and assigned literacy behaviors are used by children in high literacy environments?

Behaviors were recorded with the Literacy Observation Matrix at five-second intervals, for five minutes daily for all subjects. They were recorded during different segments of the school day and different days of the school week, so all regularly scheduled events were included in the observations.

LITERACY AND NON-LITERACY BEHAVIORS FOR 140 SUBJECTS

	Frequency	% of behaviors*
Total Literacy	26811	63.4
Not Located	379	0.9
No Lit.Activ.	15044	35.6
Total Behaviors	42234	

* percentages have been rounded

Approximately 63% of all recorded behaviors were literacy behaviors, the remaining entries recorded as NL (not located) or NA (no literacy action.)

The subjects in this group of seventeen high level literacy environments were most often observed manipulating (26.4% of literacy behaviors), with observing (25%) the second most common literacy behavior and writing (19.9%) the third, as shown below.

LITERACY BEHAVIORS FOR 140 SUBJECTS

	Write	Read	Manip	Obs	Disc	Scan	T.Lit	NA	NL	Total
All	5351	4280	7089	6706	2813	572	26811	15044	379	42234
Optional	1055	1585	2552	2363	2042	388	9985			
Assigned	4296	2695	4537	4343	771	184	16826			

Reading (15.9%), discussing(10.4%), and scanning (02.1%) were recorded as the fourth, fifth and sixth most frequent, in that order. Ranking of the literacy behaviors is shown on the following page.

Optional and Assigned Literacy Behaviors

When optional and assigned behaviors are examined separately, the rankings are consistent on four of the five literacy behaviors. In both optional or assigned categories, manipulating was the most recorded behavior, and ranked the same way when optional and assigned behaviors were combined. The same rela-

tionship exists within the data on observing (ranked third), reading (ranked fourth) and scanning (ranked sixth).

Of all the recorded literacy behaviors, children initiated and teachers assigned manipulating and observing most often; however children chose to use discussing as the next most frequent behavior, then reading, writing, and scanning in that order. Teachers assigned, on the other hand, writing, reading, discussing, and scanning in that order.

LITERACY BEHAVIORS:
RANK BY FREQUENCY OF OCCURRENCE
AND PERCENTAGE* OF TOTAL LITERACY

	Optional: Rank	Optional: %	Assigned: Rank	Assigned: %	O + A: Rank	O + A: %
Writing	5	3.9	3	16.0	3	19.9
Reading	4	5.9	4	10.0	4	15.9
Manipulating	1	9.5	1	16.9	1	26.4
Observing	2	8.8	2	16.1	2	25.0
Discussing	3	7.6	5	2.8	5	10.4
Scanning	6	1.4	6	0.6	6	2.1

* percentages have been rounded

Although several literacy behaviors show the same rank for optional and assigned behaviors, the relative proportions of each in relation to all literacy behaviors are different as shown in the table above.

Approximately 37% of all recorded literacy behaviors were optional, while the other 63% were recorded as assigned. The data for each literacy behavior shows some differences between

the patterns of child-initiated literacy and those assigned by teachers, in the proportion of each behavior that is optional and that is assigned (shown below).

PROPORTION OF OPTIONAL AND ASSIGNED CATEGORIES FOR EACH LITERACY BEHAVIOR *

	Assigned	Optional
Writing	80 %	20 %
Reading	63 %	37 %
Manipulating	64 %	36 %
Observing	65 %	35 %
Discussing	27 %	73 %
Scanning	32 %	68 %
All Literacy	63 %	37 %

* percentages have been rounded

Teachers assigned over half of the writing, reading, manipulating, and observing behaviors, but children initiated over half of the discussing and scanning behaviors. The informal observation notes offer some descriptions of the classroom events associated with assigned and optional behaviors, and with behaviors recorded as NA.

Assigned writing behaviors occurred as children completed teacher designed activities, both formal and informal. For example, completing exercise pages in spelling workbooks, practicing handwriting, writing in journals, writing teacher-titled stories, reporting findings from a nature walk, recording guinea pig behavior, presenting a small group's plan for a class event in writing. Optional writing behaviors were seen

during self-selection, in classrooms where there were recording tools and materials widely distributed (i.e. writing names in an "appointment book" in a dramatic play area, making "grocery" lists, writing stories like a friend's, co-authoring). Children responded in writing on sign-on charts asking for opinions, used sign-ons to start a club, made lists of favorite books or favorite people and wrote notes to teachers and each other.

Assigned reading behaviors often occurred within the same activities as assigned writing, in which children read directions and task cards prior to assigned writing. Children also read recipes in teacher planned small group cooking activities, read from basal readers to the teacher, read trade books during "Sustained Silent Reading", looked up spelling words in a dictionary in order to write definitions, read morning messages aloud together. Optional reading behaviors were seen within both assigned and chosen activities; for example during a social studies activity children solved a dispute about Guatemala by reading a passage in a book; three children using a graphics computer program read the teacher-written manual aloud to each other to find out how to save their design. In other contexts children read schedules, menus, group lists, instructions for operation of projectors, sign-on lists in order to find out something they needed to know. They read trade books, parts of textbooks, other children's writings (displayed and in journals) and they read their mail from inter-classroom postal systems.

Assigned manipulating behaviors occurred when children began their work - turning pages, preparing the paper or booklet they would write on. They also cut out sentence strips, cut shapes on which they had written, located personal journals by sorting through a pile of labeled folders, sorted vocabulary cards, selected colored marking pens to write or illustrate a required piece of writing. Optional manipulating behaviors were observed within assigned activities when children had a choice of form or materials for required products: making books, folding paper, cutting special shapes to write upon. Manipulating behaviors in children's chosen activities resembled those within assignments.

Assigned observing occurred during whole-group sessions, as teachers read stories and children observed, teachers demonstrated handwriting, teachers pointed out entries on posted schedules and read them aloud. The behaviors also were seen when teachers worked with individuals or small groups in reading or writing activities, as the teacher showed something or read aloud from a page as children observed. Optional observing appeared to be quite different than assigned. While teachers assigned children to watch an adult, and children sometimes chose to observe adults reading, they were more likely to observe each other work. They looked closely at the words forming on a page, or an illustration and caption being created. They observed others' literacy activity to look for ideas, express interest in what was being done, or find out procedures for their work or activities, and they observed others reading.

Assigned discussing was associated with teacher directed large group talking sessions, teacher individual or group instruction (when children might be asked to discuss something just read) and in small group, complex, cooperative activities. Discussions in these settings revolved around task cards and other directions, information read from books or charts, writing of summaries or other group products. Optional discussing was seen in both assigned and chosen composition/writing activities, as children read and discussed each other's work, or consulted about conventions of print. They also discussed book selection, contents and illustrations.

Assigned scanning was the least observed literacy behavior, seen when teachers directed children to look at large-print displayed references to verify or proof writing. Optional scanning was done for the same purpose; children scanned the references and any other displayed print available which might give information about conventions. They also scanned for information that would help them interpret print.

NA behaviors are not literacy behaviors; however the large number recorded make it important to examine this category. Observer notes show many circumstances in which children are required not to engage in literacy, and other times when they choose not to. Records indicate long series of NA entries when a principal interrupts with announcements on a public address system; while children await opportunity to speak to the teacher, when a teacher gives directions unaccompanied by print;

in a reading group waits silently as one person finds the page. In some environments transitions can show many NA entries, yet in others (depending on environmental literacy stimuli) children show literacy behaviors while lining up, getting ready, waiting a turn. At times children choose activities which do not involve literacy, such as mixing paint, making puppets, constructing with blocks (although a surprising number of children do incorporate literacy into these activities.)

The matrix data do not include information about the social settings of literacy activities; however the informal observations underscore the social nature of children's literacy activity. Optional literacy behaviors were frequently done in collaboration or in companionship with another child. Whenever possible the same social qualities were brought to assigned literacy behaviors; on a number of occasions the social behavior was not acceptable within the house rules for a particular activity, and children were reprimanded.

Literacy Behaviors for Full-Data Subjects

In order to examine the literacy behaviors of full-data subjects in different environments, the data has been expressed as behaviors-per-child because of the differences in number of subjects in each classroom. Full data subjects are those for whom there are five full days of literacy behavior records from the Literacy Observation Matrix.

The amount of total literacy per child (see Appendix A, Part II for complete data) is quite varied among the environments,

ranging from a low of 29.60, to a high of 237.78. The figures represent a total of 25 minutes of observation records for each child; at the least they describe about one literacy behavior per minute, or at the highest more than nine. The amount of optional and assigned literacy also shows a wide range; the environments show from 5.80 to 117.75 optional behaviors per child, and from 14.80 to 200.89 assigned literacy behaviors.

Behaviors in High and Moderate Access Settings

One of the purposes of this study is to describe children's literacy behaviors in high-level literacy environments with varying levels of access. The data is highlighted here by examining behaviors within environments at the extreme ends of the range of access for the subject-classrooms. Further information about these subjects is shown in a table on page 5.

The environments of this study are high in literacy and also high in access, in comparison with a majority of elementary classrooms; so the group at the upper end of the range have been labeled "high" and those at the lower end of the range "moderate" in the following discussion.

All behavior data from the four environments with the highest rank in access/child have been combined, then averaged per child for the high access group, and again for the moderate access group. The following table shows the high access group with a somewhat higher number of literacy behaviors per child than the moderate access group; the reverse is shown for

non-literacy behaviors recorded for the groups, with the moderate group showing a higher number.

LITERACY AND NON-LITERACY BEHAVIORS FOR FULL-DATA SUBJECTS
IN HIGH AND MODERATE ACCESS ENVIRONMENTS
(BEHAVIORS PER CHILD)

	n	Acc./Child	Literacy	Non-Lit	Assigned	Optional
High						
M-6	4	1.24	201.2	97.0	83.5	117.7
F-4	5	.69	180.8	114.2	101.2	79.7
M-2	7	.69	181.6	113.9	94.0	85.5
M-7	14	.66	177.3	119.9	69.8	107.4
Group	30		188.1	118.3	85.9	102.2
Moderate						
K-4	8	.35	104.7	176.0	40.6	64.1
M-4	8	.35	224.7	670.1	111.4	113.4
F-1	6	.18	210.5	79.0	146.8	63.7
K-2	4	.15	148.0	218.0	74.0	74.0
Group	26		172.7	127.6	92.0	80.7

Assigned and optional behaviors recorded in each of the groups show differences within, as well as differences between the groups. The following table shows individual high access settings most different in assigned observing, and most alike in assigned scanning. In moderate environments the greatest range is in total writing, the smallest in assigned scanning.

When the data are examined for the groups of environments, there are differences in general literacy behaviors per child (total behaviors for each category) for the combined groups.

LITERACY BEHAVIORS-PER-CHILD IN HIGH AND
MODERATE ACCESS ENVIRONMENTS

High	N/5	WrA	WrO	WrT	RdA	RdO	RdT	MnA	MnO	MnT
M-6	4	46.25	0.75	47.00	23.25	17.25	40.50	14.00	50.25	64.25
F-4	5	18.33	2.00	20.33	5.83	33.00	38.83	9.33	19.83	29.17
M-2	7	24.29	3.00	27.29	5.43	24.86	30.29	9.29	21.43	30.71
M-7	14	29.64	20.86	50.50	16.79	15.21	32.00	9.86	20.71	30.57
Group	30	29.33	10.93	40.26	13.36	21.80	35.16	10.55	25.30	35.80
Moderate										
K-4	8	6.25	2.75	9.00	2.25	14.38	16.63	8.75	6.75	15.50
M-4	8	33.88	25.38	59.25	6.75	12.75	19.50	25.13	29.63	54.75
F-1	6	25.83	6.67	32.50	18.67	5.33	24.00	27.00	21.83	48.83
K-2	4	0.10	3.20	3.30	3.55	1.55	4.90	3.35	5.95	9.30
Group	26	18.38	12.65	31.03	9.80	10.61	20.42	19.23	20.23	40.03

High	ObsA	ObsO	ObsT	DisA	DisO	DisT	ScA	ScO	ScT
M-6	0.00	42.25	42.25	0.00	7.00	7.00	0.00	0.25	0.25
F-4	66.17	17.33	83.50	0.50	6.33	6.83	1.00	1.17	2.17
M-2	52.43	17.86	70.29	2.57	20.29	22.86	0.00	0.14	0.14
M-7	10.64	15.79	26.43	2.93	32.36	35.29	0.00	2.50	2.50
Group	30.43	20.63	51.06	2.06	22.03	24.10	0.20	1.46	1.66
Moderate									
K-4	23.63	23.63	43.13	3.88	8.75	12.63	0.00	7.88	7.88
M-4	34.25	24.25	58.50	9.38	18.00	27.38	2.00	3.38	5.30
F-1	67.67	7.67	75.33	6.67	16.83	23.50	1.00	5.33	6.33
K-2	2.00	3.45	5.45	1.05	0.85	1.90	0.00	0.00	0.00
Group	33.69	19.15	52.84	6.42	12.76	19.19	0.84	4.69	5.50

GENERAL LITERACY BEHAVIORS PER CHILD IN 4 HIGH ACCESS AND 4 MODERATE ACCESS ENVIRONMENTS

	N	Write	Read	Manipulate	Observe	Discuss	Scan
High	30	40.26	35.16	35.80	51.06	24.10	1.66
Moderate	26	31.03	20.42	40.03	52.84	19.19	5.50

* Higher per-child frequencies are highlighted for each behavior

In general, subjects in high access environments were seen writing, reading, and discussing more than those in moderate access environments. On the other hand, children in moderate access settings were observed manipulating, observing and scanning more than those in high access rooms. The pattern becomes clearer when the specific assigned and optional behaviors are examined.

ASSIGNED AND OPTIONAL LITERACY BEHAVIORS PER CHILD IN FOUR HIGH ACCESS SETTINGS AND FOUR MODERATE ACCESS SETTINGS

	N/5	WrA	WrO	RdA	RdO	MnA	MnO
High	30	29.33	10.93	13.36	21.80	10.55	25.30
Moderate	26	18.38	12.65	9.80	10.61	19.23	20.23

	ObsA	ObsO	DisA	DisO	ScA	ScO
High	30.43	20.63	2.06	22.03	0.20	1.46
Moderate	33.69	19.15	6.42	12.76	0.84	4.69

* Higher per-child frequencies highlighted for each behavior

The high access settings show more subject behaviors in two assigned categories (assigned writing, assigned reading) and four optional categories (optional reading, optional manipula-

ting, optional observing, and optional discussing.) The moderate access subjects demonstrated more behaviors in four assigned categories (assigned manipulating, assigned observing, assigned discussing, and assigned scanning) and in two optional (optional writing, and optional scanning.) The latter data seem consistent with some of the findings in Stage II, (discussed on pages 26 and 30) related to environments with segmented, externally determined schedules, characteristic of three of the four moderate access settings. Time in the environment tended to be used for teacher determined purposes, with a high proportion of assigned activities.

Stimulus Level, Access, and Literacy Behaviors

Numerical and narrative data have been examined to seek commonalities and patterns within each stage of the study, so the literacy level, the access, and the children's literacy behaviors in the subject-classrooms could be described. The numerical data from stages I, II, and III can also be reviewed together; they can be examined for tentative associations among stimulus level, access and literacy behaviors to guide subsequent studies. A full summary table for this can be found in Appendix A of Part II. The summary table on the following page shows each environment's ranking in the group on the literacy stimuli, access, and per-child literacy behaviors. The table also shows the percentages of assigned and optional literacy behaviors which were recorded in each environment.

RANKS ON STIMULUS LEVEL, ACCESS, AND TOTAL LITERACY AND PERCENTAGES OF ASSIGNED AND OPTIONAL LITERACY BEHAVIORS PER CHILD

	Environment's Rank			% of Total Literacy	
	Stimulus Level	Access	Per-Child Literacy	Assigned	Optional
Room					
K-1	2	13	11	40%	60% *
K-2	17	17	16	50%	50%
K-3 #	9	7	-	-	-
K-4	3	14	14	39%	61% *
F-1	16	16	4	70%	30%
F-2	12	8	15	93%	7%
F-3	15	1	6	75%	25%
F-4	6	2	8	56%	44%
S-1	13	5	10	72%	28%
M-1	8	6	12	71%	29%
M-2	5	2	7	53%	47%
M-3	10	9	13	47%	53% *
M-4	7	14	2	50%	50%
M-5	11	12	3	94%	6%
M-6	4	1	5	41%	59% *
M-7	1	4	9	39%	61% *
M-8	14	10	1	82%	18%

* more than 50% of literacy behaviors are optional
\# no full-data subjects
% rounded percentages

Ranking Patterns

As the table indicates, five environments show more than half of recorded literacy behaviors as optional; of these, two (M-3, M-6) show some consistency across their rankings, falling within a 5 rank range on the three characteristics of stimulus level, access, and literacy per-child (M-3 in lower middle ranks and M-6 higher). The remaining three of these five environments

show a mixed pattern, consistently ranked on two characteristics, and markedly different on a third. The ranking patterns for these three are not alike. One (M-5) ranks high in total literacy per child, but low for stimulus level and access; the others (K-1,K-4) fall in high ranks for stimulus level, but lower on access and total literacy.

There is consistency in ranking across the characteristics of stimulus level, access, and literacy per child for few environments. As the table shows, a particular rank for literacy stimuli is not necessarily associated with a similar rank for access or for literacy behaviors per-child. However, where consistency does appear, it is found at the highest levels or the lowest levels.

Stimulus Level Ranks

Four environments highest in literacy stimulus level also show more than half of the literacy behaviors as optional. Three environments ranked low in literacy stimuli, at the 14th, 15th, and 16th ranks show considerably more assigned than optional literacy behaviors, but the 17th ranked classroom showed 50% of each.

Access Rankings

Environments quite low in access rank are not alike in the form (optional or assigned) of literacy behavior which is higher. The single lowest access environment showed 50% optional and assigned, while the next in rank showed 30% optional and 70% assigned. The highest access settings also vary; the highest

access environment showed over half of literacy behaviors optional, while neither of the rooms which shared the second rank showed as much as 50% optional.

Literacy per Child Rankings

The rankings on literacy per child in relation to the proportion of optional and assigned literacy are interesting. Within the eight environments ranking in the upper half of the group, six show more assigned than optional literacy behavior, and one shows half. The environment which ranks 5th shows more optional behavior; it also ranks high (1st and 4th) in literacy stimulus and access. Most of the higher ranking in literacy per child appear in settings where teachers assigned the majority of literacy behaviors, but there is one exception to this (M-6).

In the lower half of the group four environments show more optional than assigned; however three show more assigned behavior and one shows optional and assigned evenly divided. Lower ranking in behaviors per child doesn't necessarily reflect particular proportions of assigned and optional behaviors.

Grade Level Patterns

Five multi-age and kindergarten environments (each housing double groups) account for all settings with more optional than assigned behaviors. Four of these were in the highest ranks on literacy stimulus and one was in the middle ranks; the two kindergartens, however, were in lower ranks.

First and second grade classrooms (all single group environments) showed no consistent patterns in rankings and proportion of literacy behaviors, except that all showed more assigned than optional literacy.

CONCLUSIONS

The basic purposes of this study are to describe high level literacy environments; and to describe the optional and assigned literacy behaviors of children in settings with high stimulus levels, but with different levels of access. The conclusions presented here offer some generalized descriptions of high-level literacy environments and children's uses of literacy, as we have seen them in the seventeen kindergarten-primary classrooms of this study. The beginning assumption, that the classrooms to be studied present literacy environments with high stimulus levels, relative to classrooms in general, is also basic to the conclusions.

Literacy Environments

What do literacy environments provide to stimulate children's spontaneous uses of literacy?

Patterns of spatial organization and provisioning are distinctive in the literacy environments. All are subdivided into eight or more clearly defined areas for children's activity. They are fully provisioned with literacy materials, which are widely distributed. Much of the print in the environment is child-pro-

duced; child written messages are the second most plentiful literacy stimuli in the environment, after recording tools. A variety of recording tools and materials, references and books are visible and within children's reach in every area; and most areas also offer display space for children's use.

The larger environments (double-sized) display more daily information in print and offer a wider distribution of books, references, recording tools and materials than smaller rooms; they also have more spatial subdivisions in which to display them. In environments which house the most children,(two-session kindergartens, double multi-age rooms) children produce more displayed literacy than in classrooms housing fewer children; this increases the literacy stimulus level of the environment.

It takes an overall high level of literacy stimuli to support several literacy functions well (functional use, book use, communication, content, child writing, variety). The lower the stimulus level, the fewer functions which can be effectively supported. Children in environments which best support the content function tend to engage in more spontaneous literacy than other children.

Access to the Literacy Environment

What access do children have to the materials and arrangements of the literacy environment?

We have seen that children in the environments showing the highest levels of access engage in more voluntary (optional) literacy than children in settings with lower access levels.

Teachers provide access to displayed literacy stimuli throughout the day in many environments; children gain access on their own in other settings. Children gain access through furtive literacy activity, by rapid use of materials during transitions, and by trying to incorporate them into activities not designed for literacy. On occasion, teachers prevent children from making use of the displayed literacy stimuli.

The question of access is complex. There are often conditions which make it difficult to provide access, such as interrupted and segmented schedules, many pull-out programs, or heavy agendas of assignments for children. Different teachers try a variety of ways to give children opportunity and time to respond to the environment. Some provide access through open-ended assignments, some through self-selection, some through scheduling or through a combination of arrangements. When teachers don't provide access, children do what they can, whenever they can, to make use of the literacy materials which attract them.

The physical environment, and the time and opportunity to make use of it, work together in some way to create overlapping dimensions of access. It is clear that children are attracted to displayed literacy stimuli and are persistent in gaining access. It may be that their persistence sometimes compensates for lack of formal access, and enables children to become involved in literacy behavior despite barriers to the environment. Records of children's usage of displayed literacy stimuli may provide one

dimension of access, but additional ways need to be developed to more clearly distinguish among levels of access.

Literacy Behaviors

What kinds of literacy behaviors do children use in high stimulus level literacy environments?

Both teachers and children are very interested in literacy in these environments. Nearly two-thirds of all behaviors are literacy behaviors, and more than one-third of those are optional. Considering the high proportions of a school day traditionally consumed with management concerns (Jackson, 1968; Gehrke, 1979) this shows a high involvement in literacy.

Teachers assign more than half of the writing, observing, manipulating, and reading behavior that occurs, asking children to manipulate literacy materials and observe more than they assign any other specific literacy behavior. Children choose more than half of the discussing and scanning behaviors that occur. They choose to manipulate, observe and discuss more than to read and write. Much of the manipulation is in preparation for writing, and much of the observation is connected with writing and reading, which children treat as social activities.

What kinds of literacy behaviors do children use in high level literacy environments with different levels of access?

Children's spontaneous literacy is somewhat different in environments with the highest levels of access than in settings of moderate access. In the higher access settings children engage in a bit more literacy behavior than other children, and considerably

more optional literacy behavior. Where access is high they choose to read, manipulate, observe, and discuss more than children in other settings. Teachers in these environments assign more reading and writing behaviors than they do in settings with lower access.

It is not clear whether literacy stimulus level and access level (as determined in this study) are associated with children's literacy behavior in similar ways. However, children in environments ranking highest in literacy level show more optional literacy behaviors than those in environments at the lowest levels.

Summary

In general, we conclude that an environment which functions on behalf of children's literacy is extremely complex. It is established through spatial organization, the teacher's provisioning with print and symbolic materials, with tools and materials for literacy. The distribution (locations) and other arrangement of literacy materials and of display facilities for children's use, affects the extent to which children respond to and contribute to the literacy stimuli of the environment.

Some organization of the day which assures children's access to the environment is necessary. Such organization can interacts with arrangements of literacy stimuli so that children make frequent use of literacy in the daily events of classroom life, some spontaneous, within teacher designed activities or self-initiated activity, and some teacher instigated.

We have seen children deeply involved in literacy in these environments arranged to support it, and have noted the persistence with which they pursue this interest. We have also seen that for children literacy is a social activity, which is accompanied by peer collaboration, commentary, observation, and appreciation; we conclude that environments arranged for literacy must also support the social qualities of children's spontaneous involvement in literacy.

SOME RECOMMENDATIONS

The descriptions given here have some implications for educational practice, and our recommendations for the classroom have been presented elsewhere (Loughlin and Martin, 1987). The findings also suggest additional investigations to further clarify the nature of a literacy environment functioning on behalf of children's involvement and growth in literacy.

The question of access is still unclear. It seems appropriate to use some measure of the uses of displayed literacy stimuli to identify access, but findings from The Inventory of Access seem too limited to distinguish environments with different qualities of access. Observations suggest possibilities that there is an interaction between access and children's high motivation for literacy which may be confusing the picture. The numerical and narrative data together suggest that the problem is in the instrumentation. Perhaps different approach to assessing use of

displayed literacy environment would provide a clearer picture. Some kind of material usage count (Loughlin and Suina, 1982, p147) rather than the children's use count might be developed, if logistically possible.

It may be time to do some small comparison studies, using wide variety of literacy environments, including some known to provide a high stimulus level, and others more typical of classrooms in general. Access should vary more among a less specialized group of subject-classrooms, and better highlight any relationships that influence literacy behavior.

Two of the instruments (Survey of Displayed Literacy Stimuli; Literacy Observation Matrix) have potential for comparison studies now, but are not sure about the Inventory of Access. However, further studies of children in functioning literacy environments should include plans for open-ended observation records of children and events at the same times they are observed through these or related instruments. There may be a time in the future when the qualities and functioning of the literacy environment are well enough understood to work directly with instrument-observation procedures, but at present there is still much to be learned.

All of our research to date has focused on kindergarten-primary classrooms. It seems likely that environments arranged to foster literacy involvement in intermediate classrooms and at the mid-school would be as interesting a subject as those in the early school years. Replications of this work at those levels could contribute to a better understanding of the environmental

influences on children's learning at older ages, and on the literacy environment in particular.

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APPENDIX A

EXTENDED DATA TABLES

DISPLAYED LITERACY STIMULI IN SEVENTEEN ENVIRONMENTS

Room	Mcd	Own	Pro	Bro	Kbk	Krt	Krm	Krf	Dir	S/u	Com	Count	D/s	D/t	Flb	Cvr	Lgb	Uncount
K-1	9	49	19	17	14	23	44	15	7	5	0	202	5	2	8	7	9	31
K-2	3	8	1	1	4	10	9	4	0	2	3	45	6	2	2	2	6	18
K-3	8	3	12	13	12	17	12	21	6	9	0	113	7	5	7	7	7	33
K-4	5	48	26	23	10	16	19	11	11	13	1	183	8	3	7	7	8	33
F-1	8	4	3	3	7	8	10	15	2	2	2	64	5	2	5	3	4	19
F-2	5	6	11	12	12	12	15	18	5	6	0	102	6	2	6	6	6	26
F-3	7	13	7	0	13	20	20	4	5	0	0	89	5	6	5	6	5	27
F-4	4	34	5	8	17	21	12	18	8	4	3	134	3	4	5	5	7	24
S-1	6	4	7	1	10	25	16	19	24	10	0	99	6	2	7	3	7	25
M-1	11	11	13	3	9	27	16	28	1	9	0	128	2	4	5	5	5	21
M-2	5	14	17	5	23	21	29	28	2	2	0	146	6	5	10	8	11	40
M-3	2	15	4	5	8	26	26	16	4	6	0	112	3	1	4	4	6	18
M-4	4	20	21	14	9	16	18	24	6	1	0	133	3	3	5	5	5	21
M-5	9	7	26	3	8	16	9	21	4	2	1	106	4	1	6	4	5	20
M-6	6	22	10	12	21	35	22	16	5	5	3	157	9	8	8	8	9	42
M-7	17	48	18	17	24	36	24	27	2	8	2	223	8	8	10	8	9	43
M-8	1	4	27	3	9	9	4	19	10	2	4	92	5	1	5	3	5	19
Totals	110	310	227	140	210	338	305	304	79	86	19	2128	91	59	105	91	114	460

Messages-current day
Child written messages
Print related to object
Book related to object
Kinds of books
Kinds recording tools
Kinds recording material
Kinds references
Displayed directions
Sign/ups
Community lang/culture
Display space
Display tools
Funct. Labels
Bk,cover displ'd
Legible print

USE AND ACCESS DATA FOR SEVENTEEN ENVIRONMENTS

	Mcd	Cwm	Pro	Bks	Rt	Rm	Ref	Dir	S/u	Com	D/s	D/t	Flb	Lgb	Ttl Uses	# Scans	# Chldn	Acc/ Child
Rooms																		
K-1	14	4	3	52	48	35	0	2	9	0	0	2	8	14	191	27	19	.37
K-2	1	0	0	58	9	1	0	0	0	0	1	2	0	0	72	32	15	.15
K-3	4	7	13	70	30	32	12	0	5	0	0	0	0	0	173	16	22	.49
K-4	3	0	0	10	5	25	2	0	17	0	0	5	6	0	73	10	21	.35
F-1	8	2	2	26	14	62	0	0	2	0	0	0	1	1	118	32	20	.18
F-2	1	4	0	87	125	57	7	0	1	0	0	1	1	1	285	28	21	.48
F-3	7	14	4	52	140	60	0	4	0	0	0	3	2	3	289	33	22	.40
F-4	0	43	0	92	53	46	3	2	6	0	0	0	1	17	263	20	19	.69
S-1	7	2	0	75	152	95	7	5	9	0	0	5	4	0	361	31	19	.61
M-1	36	3	12	68	112	102	26	5	3	0	0	4	0	18	389	35	20	.56
M-2	1	8	2	122	203	144	7	0	1	0	0	2	0	18	508	19	39	.69
M-3	9	8	0	50	80	73	4	0	13	0	1	2	6	2	248	27	20	.46
M-4	9	7	6	69	42	41	40	0	0	0	0	3	0	2	219	33	19	.35
M-5	43	13	0	28	27	19	5	17	2	0	0	4	15	31	204	27	20	.38
M-6	7	22	27	76	89	80	1	1	3	0	0	2	2	7	317	8	32	1.24
M-7	20	28	7	45	115	103	23	4	21	0	1	1	2	0	370	13	43	.66
M-8	0	1	18	35	5	12	3	3	0	0	0	0	3	8	88	9	23	.43
Totals	170	166	94	1015	1249	987	140	43	92	0	3	36	51	122	4168			

Mcd — Message current day
Cwm — Child written message
Pro — Print related to object
Bks — Books
Rt — Recording tool
Rm — Recording material
Ref — References
Dir — Displayed directions
S/u — Sign-up/sign-out
Com — Community culture/language
D/s — Display space
D/t — Display tools
Flb — Functional labels
Lgb — Displayed legible print

LITERACY BEHAVIORS IN SEVENTEEN CLASSROOMS
FULL-DATA SUBJECTS ONLY (N=126)

Room	Wa	Wo	Wt	Ra	Ro	Rt	Ma	Mo	Mt	Oa	Oo	Ot	Da	Do	Dt	Sa	So	St	TaL	ToL	TL
K-1	18.25	9.75	28.00	5.63	14.38	20.00	16.13	27.63	43.75	23.63	23.38	47.00	3.13	23.88	27.00	0.00	3.00	3.00	66.75	102.00	168.75
K-2	2.00	64.00	66.00	3.55	1.35	4.90	3.35	5.95	9.30	2.00	3.45	5.45	1.05	0.85	1.90	0.00	0.00	0.00	14.80	14.80	29.60
K-3*	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
K-4	6.25	2.75	9.00	2.25	14.38	16.63	8.75	6.75	15.50	19.50	23.63	43.13	3.88	8.75	12.63	0.00	7.88	7.88	40.63	64.13	104.75
F-1	25.83	6.67	32.50	18.67	5.33	24.00	27.00	24.83	48.83	67.67	7.67	75.33	6.67	16.83	23.50	1.00	5.33	6.33	146.83	63.67	210.50
F-2	9.80	8.20	18.00	4.20	8.00	12.20	16.00	33.00	49.00	36.60	27.60	64.20	6.00	13.00	19.00	0.60	3.60	4.20	73.20	5.80	73.20
F-3	36.80	11.10	47.90	23.60	1.60	25.20	25.40	8.10	33.50	38.50	12.50	51.00	6.20	9.20	15.70	5.50	3.70	9.20	136.00	46.50	182.00
F-4	18.00	2.00	20.33	5.83	33.00	38.38	9.33	19.83	29.17	66.17	17.33	83.50	0.50	6.33	6.83	1.00	1.17	2.17	101.17	79.67	180.83
S-1	35.40	0.30	35.70	39.80	5.40	45.20	32.70	5.50	38.20	15.90	9.00	24.90	3.30	26.70	30.00	1.00	1.70	2.70	128.10	48.60	176.70
M-1	11.11	1.33	12.44	18.56	9.78	28.33	16.44	15.22	31.57	58.22	11.00	69.22	13.11	7.78	20.89	0.00	3.56	3.56	117.44	48.67	166.11
M-2	24.29	3.00	27.29	5.43	24.86	30.29	9.29	21.43	30.71	52.43	17.86	70.89	2.57	20.29	22.86	0.00	0.14	0.14	94.00	85.57	181.57
M-3	14.88	5.50	20.38	14.38	8.50	22.88	9.75	19.13	28.88	16.75	19.88	36.63	2.38	11.13	13.50	1.63	2.38	4.00	59.75	66.50	126.25
M-4	33.88	25.38	59.25	6.75	12.75	19.50	25.13	29.63	54.75	34.25	24.25	58.50	9.38	18.00	27.38	2.00	3.38	5.38	111.38	113.38	224.75
M-5	67.44	1.67	69.11	45.67	0.67	46.33	15.44	2.44	17.89	44.44	2.78	47.22	23.56	2.78	26.33	4.33	2.22	6.56	200.89	12.56	213.44
M-6	46.25	0.75	47.00	23.25	17.25	40.50	14.00	50.25	64.25	0.00	42.25	42.25	0.00	7.00	7.00	0.00	0.25	0.25	83.50	117.75	201.25
M-7	29.64	20.86	50.50	16.79	15.21	32.00	9.86	20.71	30.57	10.64	15.79	26.43	2.93	32.36	35.29	0.00	2.50	2.50	69.86	107.43	177.29
M-8	105.89	1.89	107.78	55.89	7.56	63.44	19.56	9.78	29.33	8.33	10.44	18.78	1.00	11.11	12.11	3.22	3.11	6.33	193.89	43.89	237.78

* No full-data subjects

W: writing
R: reading
M: manipulating
O: observing
D: discussing
S: scanning
a: assigned
o: optional
t: total (a+o)

STIMULUS LEVEL, ACCESS, AND PER-CHILD LITERACY BEHAVIORS
IN SEVENTEEN ENVIRONMENTS

	Stimulus Level		Access/Child		Tot.Lit.Behav.		Assigned Lit.		Optional Lit.	
	Score	Rank	Score	Rank	Per-Ch.	Rank	Per-Ch.	%ofTL	Per-Ch.	%ofTL
Room										
K-1	202	2	.37	13	168.50	11	66.75	40%	102.00	60%
K-2	45	17	.15	17	29.60	16	14.80	50%	14.80	50%
K-3 *	113	9	.49	7	-	-	-	-	-	-
K-4	183	3	.35	14	104.75	14	40.63	39%	64.13	61%
F-1	64	16	.18	16	210.50	4	146.83	70%	63.87	30%
F-2	102	12	.48	8	79.00	15	73.20	93%	5.80	7%
F-3	89	15	.40	11	182.50	6	136.00	75%	46.50	25%
F-4	134	6	.69	2	180.83	8	101.17	56%	79.67	44%
S-1	99	13	.61	5	176.70	10	128.10	72%	46.80	28%
M-1	128	8	.56	6	166.11	12	117.44	71%	48.67	29%
M-2	146	5	.69	2	181.57	7	94.00	53%	85.57	47%
M-3	112	10	.46	9	126.25	13	59.75	47%	66.50	53%
M-4	133	7	.35	14	224.75	2	111.38	50%	113.38	50%
M-5	106	11	.66	12	213.44	3	200.89	94%	12.56	6%
M-6	157	4	1.24	1	201.25	5	83.50	41%	117.25	59%
M-7	223	1	.66	4	177.29	9	69.86	39%	107.43	61%
M-8	92	14	.43	10	237.78	1	193.89	82%	43.89	18%

* no full-data subjects
% rounded percentages of total literacy

APPENDIX B

PROCEDURAL DETAILS

STAGE I

PROJECT DIRECTIONS

Here's the way we've agreed to carry out the Survey Environment part of the project:

Some of the procedures are designed to help us study the Survey instrument to see how reliable it is. We want to know whether two independent surveyors can characterize the environment in the same way using the same instrument in the same environment. Since, by definition the arranged environment is always changing, we can only be sure the environment is the same if both people survey at the same time.

Other procedures are needed to keep the intrusion into the classroom to a minimum. For this reason, **whenever possible Wednesday afternoon is the scheduled time**, because children aren't there. If needed, the survey can be carried out after 3:30 on other weekdays, with prior arrangements at the school.

TWO PEOPLE will sketch the environment on the same day. It will be necessary decide together where the area divisions will be, so they will be using the same areas on the Survey of Displayed Literacy Environment.

THE SURVEY will be carried out on the same day by the same people. Each will work independently, without consulting each other about judgments. The scoring and summary sheets should be filled out at the end of the survey.

Please **leave the survey and the sketch map in the box of Stage II materials.** They will be needed for Stage II.

THE INVENTORY SCHEDULE INFORMATION that is needed for Stage II is listed on a green sheet that is also in the yellow packet. Please talk with the classroom teacher, and/or borrow a copy of the schedule, to get the information, and write it on the sheet. Please **leave the Inventory Schedule Information Sheet in the box of Stage II materials.**

GENERAL SCHEDULE INFORMATION

Classroom_____School_____

Day begins at _____

Morning recess from _____ to _____

Lunch from _____ to _____

Lunch recess from _____ to _____

Afternoon begins at _____

Afternoon recess from _____ to _____

Special out-of-room events that are regularly scheduled:

	Day	Time
Library	_____	_____
Music	_____	_____
P.E.	_____	_____
	_____	_____
	_____	_____

Any special events (field trips, conferences, testing, etc) that will keep children away from normal activities for half or full day?

Event_____Day/Time_____

Event_____Day/Time_____

Event_____Day/Time_____

Event_____Day/Time_____

****

STAGE II - ACCESS INVENTORY

PROJECT DIRECTIONS

In order to have a continuous record of uses of displayed literacy stimuli through the day, two people will work together in the classroom. As soon as one person has completed a scan, the other will begin a new scan. We've agreed to use the instrument in these ways:

ARRIVE before the children enter the classroom, and fill out the front page of the scan-record, using information from the Survey of Displayed Literacy Stimuli and Sketch Map. Check how many children are in the class. If there are more than 26, add an extra scan-record page to each form.

BEGIN recording as soon as the first child enters the environment, using procedures described on Inventory cover sheet. REMEMBER that you are recording uses of only the displayed literacy stimuli that were recorded on the yellow Survey record. If you notice some stimuli present that weren't there when you did the Survey, include those materials that could have been recorded if present at the time. (However, don't change the survey.)

NOTIFY your partner as soon as your scan is completed, so she can begin.

CHECK the first page of the scan, as soon as you are finished, to be sure the information about time begun, time ended, and events during the scan is clearly recorded.

WRITE the names or identification of the individual children on a new scan-record in the same order as on your previous scan. Replace identification phrases with names as soon as you are sure of them.

BEGIN a new scan as soon as your partner notifies you the previous scan is completed.

CONTINUE to record until all children have left the environment.

RESUME the scan-record as soon as the first child returns unless the group has been away more than 20 minutes.

BEGIN a new scan when the group returns after an absence of more than 20 minutes.

THE SCORE SHEET

At the end of the day, take off your shoes, and prepare the scan-records and score sheets for someone else to read. Fill in children's names where they are missing. Review each record and clarify handwriting or abbrevia-

tions you have used. Order each set of scan-records by time. Check to be sure events and times are clearly recorded (questions can usually be resolved by checking the two sets of records for time and events, since they supplement each other.) Then combine the records into one set, ordered by time.

Transfer the data from the scan-records onto the scoring sheets, ordered by time. You may find it easier to record by tally, then add numbers later. Please complete the right-hand summary on the last page also.

****

STAGE III - LOM

PROJECT DIRECTIONS

We need to:

Select Subjects and Alternates
Establish an Observation Schedule
Set up the Matrix Record Sheets for Each Subject
And, of course, observe them daily.

SELECTING SUBJECTS AND ALTERNATES: Using a Table of Random Numbers and a copy of the class list for the environment you're studying, select 10 subjects (the first 8 will be subjects and the last 2 alternates). Record their names on the appropriate sheet, and show the list to the classroom teacher.

Sometimes we've selected a child who is absent every week on the same day, or one who will not be in attendance at all during the observation week. If that is the case, please select two more alternates, using the table of random numbers.

ESTABLISHING THE OBSERVATION SCHEDULE: Using the schedule information or the teachers schedule, and your own schedules, set up a plan for observation through the week that samples as many different hours of the school day as possible. Expect each day's observation to consume between 45 minutes and 1 hour of children's in-class time. (For your own schedules anticipate unexpected interruptions to in-class time that may make your time at the school somewhat longer.) Decide who will observe during which planned time.

SET UP THE MATRIX RECORD SHEETS: Prepare a record form for each subject and alternate (10 record sheets in all.) In the space for "Other" please write either "Subject" or "Alternate". Any information required on the top of the form will be available from the classroom teacher if you don't already have it.

OBSERVE: Plan to observe all 10 children you have set up as subjects and as alternates. It's likely that one or more subjects will be absent at least one observation day, and we may be able to have 5 days of observations for one of the alternates.

ADDITIONAL SOURCES OF INFORMATION ABOUT THIS RESEARCH:

Loughlin, Catherine and Cole, Nancy. (1987) A survey of displayed literacy stimuli. In Loughlin and Martin, Supporting literacy, N.Y.: Teachers College Press.

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Loughlin, Catherine (1987, Spring) Researching the learning environment: Finding a way in. Teaching and Learning: The Journal of Natural Inquiry. Vol I, 3.

Loughlin, Catherine and Ivener, Bonnie. (1988) Literacy behaviors of young children in high level literacy environments. Research Forum Paper presented at Association for Childhood Education International Annual Study Conference. Salt Lake City, Utah.

Loughlin, Catherine (1989,Spring) Inside the literacy environment. Teaching and Learning: The Journal of Natural Inquiry. Vol.3, No. 3.