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Observations of Emergent Literary Behaviors in a Literacy-Enriched Play Environment: Does Teacher Guidance Make a Difference?

Cheryl M. Totten
The College at Brockport

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OBSERVATIONS OF EMERGENT LITERACY BEHAVIORS IN
A LITERACY-ENRICHED PLAY ENVIRONMENT:
DOES TEACHER GUIDANCE MAKE A DIFFERENCE?

THESIS

Submitted to the Graduate Committee of the
Department of Education and Human Development
State University of New York
College at Brockport
in Partial Fulfillment of the
Requirements for the Degree of
Master of Science in Education

by Cheryl M. Totten

State University of New York
College at Brockport
Brockport, New York

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SUBMITTED BY:

Cheryl M. Fotten 11-25-92
Candidate Date

APPROVED BY:

Arthur E. Smith 11/18/92
Thesis Advisor Date

David L. Beggs 11/19/92
Second Faculty Reader Date

Patricia E. Baker 11/25/92
Director of Graduate Studies Date

Abstract

This study was completed to investigate whether there are differences in emergent literacy behaviors between a teacher guided literacy-enriched play environment and a literacy-enriched play environment without teacher guidance.

This study occurred over a five week period. During the first week, base-line data were collected using qualitative naturalistic observations where literacy behaviors were recorded during spontaneous play. The play area was literacy-enriched with play centers, environmental print, and literacy props. Six four-year olds were exposed to the environment for a half hour daily. During the first week of treatment, three of the subjects received teacher guidance / modeling while they played. These three subjects experienced the literacy-enriched environment without teacher guidance at a different time than the treatment group.

After three weeks of exposure to the redesigned play environment, observations of the children's literacy behaviors were noted while they played in the enriched environment. Qualitative naturalistic observations of children's literacy behaviors were used to compare the treatment and control groups. There were differences in literacy behaviors between the experimental and control groups.

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Chapter I

Introduction

Literacy behaviors emerge earlier than once thought (Isenberg & Jacob, 1983; Kleeck & Schuele, 1987; Roskos, 1991). Hence, the development of literacy in preschoolers needs to be reviewed.

Literacy is a complex activity including cognition (obtaining the knowledge of reading and writing), socialization, linguistics, and psychological aspects (Isenberg & Jacob, 1983).

Emergent literacy does not occur just by teaching children the knowledge of reading and writing skills within the framework of schooling, but involves a broader perspective that includes social skills, literacy awareness, and psychological development (Dyson, 1984, 1985; Heath, 1982, 1984). In general, the studies indicate that pretend play correlates with and has a positive effect on creativity, imagination, intellectual growth, and language (Dansky, 1980; Nicholich, 1981; Pellegrini, 1980; Yawkey, 1983). Research also indicates that teacher / parent support in the play environment enhances literacy behaviors (Graul & Zeece, 1990; Greenberg, 1980; Mandel, Morrow, & Rand, 1991).

Purpose

The purpose of this study was to compare emergent literacy behaviors in a teacher guided literacy-enriched play environment and a literacy-enriched play environment without teacher guidance.

Question to be Answered

Are there differences in emergent literacy behaviors between a teacher guided literacy-enriched play environment and a literacy-enriched play environment without teacher guidance?

Definitions of Terms

chain reaction - in terms of reading and writing, each results in or has an effect on the other.

collaborative - resulting from working, co-operating together.

composing strategy - a means of creating / developing writing skills.

environmental print - printed letters and words in the surroundings (on the walls and on objects).

free play - given the freedom to choose pleasurable activities to engage in.

literacy artifacts - reading / writing symbols of individual cultures.

natural reader - person exhibiting normal reading behaviors for his developmental stage.

observable literacy behaviors - observable reading and writing behaviors, including knowledge of literacy, skills, and specific activities.

knowledge of literacy in context - a child signing a check at the office, writing a shopping list in the kitchen, or reading a letter at the post office.

skills - manipulating a writing instrument and predicting / inferring skills.

specific activities - scribbling, copying, tracing, paper handling, pretending to read, and storytelling.

play - "pleasurable, no extrinsic goals, is spontaneous and voluntary, and involves active engagement on the part of the player" (Isenberg & Jacob, 1983, pp. 5-60).

play center - a play area marked off to represent a real life setting, like a play kitchen or office.

pre-literacy skills - skills that lead to the development of reading and writing.

pretend play - context in which children transform themselves or an object into another object, person, event, or situation through the use of motor or verbal actions in a make-believe activity.

print-rich environment - surroundings in which children are exposed to and actively involved in meaningful reading and writing materials.

rehearsals - a repeating and drilling for practice and future performance.

sustained play - attention maintained in a play activity for a prolonged period of time.

symbolic play - play experience that represents a real life experience.

teacher guidance / modeling - when the teacher participates in play, provides children with explicit information about the setting and props, and models how the children can use the props to create

pretend play and foster
literacy behaviors
(Isenberg & Jacob, 1983).

Limitations of the Study

The number of subjects was clearly a limitation of this study.

Because this study was restricted to a rural area in one culture, global conclusions can not be made about a teacher's influence on children's literacy behaviors.

Teacher guidance may not have been the only factor influencing children's emergent literacy behaviors during play in a literacy-enriched environment, but children may have readily learned from other children during the treatment period.

Chapter II

Review of the Literature

Children's early reading and writing behaviors resemble play (Calkins, 1980; Christie & Johnson, 1983; Kennedy, 1991; Roskos, 1990). Play and emergent literacy both involve the production and comprehension of oral language, and therefore both prepare children for symbol-using processes (Christie & Johnson, 1983; Galda & Pellegrini, 1990; Pellegrini, 1985).

Pretend play facilitates a new use of imaginative oral language which prepares the user as a reader who interprets written text and a writer who creates written text (Galda & Pellegrini, 1990; Roskos, 1991). Some observable clues that reveal that there is a transformation from oral language to writing include the following quotations made by preschoolers observed by Roskos (1991): "make a note," "sign up," "scribble," "print," "write it down," and "make a ticket." "It has words" reveals that there is a transformation from oral language to reading (Neuman & Roskos, 1990).

The creative engagement of reading and writing during play develops emergent literacy behaviors (Anderson & Stokes, 1984; Isenberg & Jacob, 1983; Roskos, 1988; Roskos, 1990).

"Activities such as book handling, pretending to read, and scribbling seem to serve as rehearsals for more conventional forms of reading and writing"(Roskos, 1991, p.39). Children's collaborative engagement in literacy through play has a role as a composing strategy for the development of children's writing abilities (Cox, Drisden, Galda & Pellegrini, 1991; Daiute, 1991; Neuman & Roskos, 1991). Writing involves creating print that carries a message. Observable behaviors that convey specific writing skills include children pretending to write (scribble) and forming letters. Observable behaviors that convey knowledge of writing in situations or environmental contexts include children signing a check in an office situation and writing a shopping list in a kitchen setting. Observable behaviors that convey specific reading skills include children handling books (orientation and positioning skills), turning pages in books and of paper (left to right orientation), storytelling, and pretending to read. Observable behaviors that convey knowledge of reading in situational or environmental contexts include children sharing books and reading environmental print such as restaurant menus. (Roskos, 1991)

The Effect of a Literacy-Enriched Play
Environment on Emergent Literacy Behaviors

Physical environment can have a significant effect on children's play (Neill, 1982). All children proceed through a sequence of developmental stages, but the rate of development is different depending on their environment (Oguru, 1991).

Observation of "natural" readers confirms the benefits of a print-rich environment in which children are actively involved in meaningful reading and writing (Greenberg, 1980; Heibert, 1981). "Young children, even those from homes where exposure to a literate environment is not likely to occur, can develop important pre-literacy skills" when provided with a language- and print-rich classroom environment (Blum, Logsdon, & Taylor, 1986, p. 132). Careful preparation of materials and setting promotes literacy by encouraging voluntary, spontaneous literacy behaviors while children are at free play (Greenberg, 1980; Morrow & Strickland, 1989).

Pretend play provides a meaningful context or reason for children to practice specific, literacy related skills and behaviors (Galda & Pellegrini, 1990; Greenberg, 1980, 1982, 1983, 1984; Roskos, 1990, 1991; Yawkey, 1983). Children incorporate their knowledge of reading and writing

in different real life situations (like the kitchen, office, post office, and library) in play settings to achieve a larger purpose, that of lending credibility to the play event itself (Roskos, 1991). Children also incorporate literacy in play to enhance and make sense of their play experience (Neuman & Roskos, 1990). Literacy activities during play exemplify the functional dimension of literacy (Roskos, 1991).

In a play environment without literacy-enrichment, children use felt-tipped markers separate from a play setting such as the kitchen (Neuman & Roskos, 1990). In a literacy-enriched play environment, children use markers in a meaningful context, e.g. an office play setting where they sign up children to help the homeless (Neuman & Roskos, 1990). In a literacy-enriched play environment, Neuman and Roskos (1990) found that themes are developed during play (child writes a recipe in the kitchen, he follows the recipe to make dinner, and goes to the post office to send the recipe to a friend). There is a chain reaction between reading and writing in a literacy-enriched play environment (Neuman & Roskos, 1990). A chain reaction in the kitchen setting is revealed by children writing a recipe and then reading the recipe. The recipe theme also carries the child between settings

between the kitchen and the post office. In a play environment without literacy enrichment, children have few concrete cues of props available to rely on to create contexts for literacy interaction or use (Neuman & Roskos, 1990). Without the thematic development found in an enriched play environment, a child tends to run from one activity to another, not having his attention sustained in one activity long enough to allow for meaningful practice in literacy (Neuman & Roskos, 1990). Purpose gives children practice in (use of) literacy, developing emergent literacy (Morrow & Strickland, 1989).

Neuman and Roskos' (1990) design was the cornerstone of the procedures used in this study. They utilized two preschool classrooms with thirty-seven preschoolers between the two classes to find out the frequency and quality of literacy behaviors in a literacy-enriched play environment. Four variables were employed in the play environments to make them literacy-enriched.

1. Centers were separated from each other by such objects as tables.
2. There was an increased amount of environmental labelling.
3. Centers were developed to represent common, real-life, literacy situations.
4. Centers were arranged adjacent to one another to facilitate movement between them and encourage play themes.

Literacy props were selected based on whether they were real items that children would find familiar, natural, and functional to use in the play centers. (Neuman & Roskos, 1990).

Prior to intervention, children's literacy behaviors were observed and recorded for a ten-minute period on four separate occasions by two trained observers. The physical environment was redesigned with literacy-enriched materials. No formal observations occurred over the next four weeks. After the four-week period, the children's literacy behaviors were systematically observed. The observations made prior to and following the intervention were analyzed to determine in what ways the literacy-enriched environment may have influenced the subjects' literacy behaviors. Literacy in play became more purposeful, sustained, situational / contextual, connected / related in terms of theme development, interactive, and role-defined. (Neuman & Roskos, 1990)

Designing Literacy-Enriched Play Environments
to Maximize Emergent Literacy Behaviors

Play center environments can be designed to facilitate / maximize the enrichment of literacy interactions. Interactive play and task involvement are enhanced by small, intimate, and well-defined play centers (Field, 1980). Centers thematically related and designed to be close to each other in proximity allow children to move

naturally between them when playing, sustaining the child's attention to allow for meaningful practice in literacy (Field, 1980). Labelling centers and environmental objects with print and symbols (pictorial cues) is a benefit to children's literacy awareness and development (Neuman & Roskos, 1990). Authentic, safe props related to language, such as coupons from the kitchen and library cards from the library, should be added to the appropriate centers so that children can use their prior knowledge of the props to develop a purposeful literacy experience (Morrow & Strickland, 1989; Neuman & Roskos, 1990).

The Effect of Teacher / Parent Play Guidance on Emergent Literacy Behaviors

Research suggests that a teacher / parent supportive play environment enhances literacy behaviors. Play begins with infant-adult interaction soon after birth rather than with later interactions (Whaley, 1990). Children use more complex forms of symbolic play when they play with their mothers than when they engage in solitary play (Fiesi, 1990). Training mothers and caregivers to facilitate children's play enhances preschoolers' verbal cognition (Graul & Zeece, 1990). Children are more likely to engage in voluntary literacy behaviors

during free play when literacy materials are introduced and teachers guide children to use those materials (Greenberg, 1980; Mandel, Morrow, & Rand, 1991).

Summary

Research indicates that there are both correlational and cause / effect relationships between literacy and play. Literacy and play are similar in that they both involve production and comprehension of oral language. Play has a positive effect on emergent literacy. A play environment enriched with literacy materials enhances emergent literacy behaviors. Authentic props related to language added to the play environment facilitate literacy. Research also suggests that a teacher's modeling of literacy behaviors using the authentic props is an additional enhancement to literacy behaviors.

Chapter III

Design of the Study

Hypothesis

There are differences in emergent literacy behaviors in four-year olds between a teacher guided literacy-enriched play environment and a literacy-enriched play environment without teacher guidance.

Methodology

Neuman and Roskos' (1990) methodology was used as a model for this study. Four-year olds were used as subjects. The setting was their familiar play area, literacy-enriched materials were employed, and qualitative naturalistic observations of children's language behavior were used to compare the treatment and control groups. Neuman and Roskos (1990) were testing the effect of a literacy-enriched environment on emergent literacy, so the experimental group experienced the literacy-enriched environment while the control group did not experience the literacy-enriched environment. The present study focused on the effect of teacher guidance in a literacy-enriched environment on emergent literacy, so the treatment group experienced teacher guidance in a literacy-enriched environment while the

control group just experienced the literacy-enriched environment.

Subjects

The subjects of this study included six four-year olds from a rural day care center. Three of the subjects were randomly selected to be exposed to a reading- and writing-enriched play environment without teacher guidance, and three of the subjects were randomly selected to be exposed to a reading- and writing-enriched play environment with teacher guidance.

Materials

Materials for the study were identified by Neuman and Roskos (1990). They included tables and shelves to establish play centers (post office, library, office, kitchen): mobiles to identify each play center; environmental print and symbolic forms (pictures) on labels to identify environmental objects such as storage bins; and literacy props which are listed below. Safety and usefulness in terms of literacy development were considered in choosing props.

Table 1. Literacy Props in the Literacy Enriched Play

<u>Environment</u>		
<u>Play Center</u>	<u>Literacy Props</u>	
kitchen	telephone book	emergency number details
	real telephone	blank recipe cards
	cookbooks	labelled recipe box
	stationary	plaques with words
	play money	magnets with words
	message board	pens, pencils, markers
	calendar	large plastic clips
office	calendar	appointment book
	message pads	signs that read opened / closed
	file folders	books and magazines
	racks for filing	index cards and forms
	in/out tray	post-its and address labels
post office	play money	large plastic clips
	typewriter	pens, pencils, and markers
	assorted forms	envelopes of various sizes
	stationary	stickers, stars, stamps
	stamp pads	post office mail box
	address labels	tote bag for mail
	calendar	large plastic clips
	small tray	posters / signs about mailing
	pens	pencils and markers

library

bookmarks

library book return card

paper

stamps for marking books

stickers

variety of children's books

telephone

pens, pencils, markers

telephone book

sign in / sign out sheet

calendar

ABC index cards

file folders

posters of children books

Procedures

Before the study, the day care center allowed children to self-select from various play activities. Literacy materials available in the play area before the study included books, letters and words on walls, and plastic letters. Previous to the study, children were allowed to use chalk, chalkboards, crayons / markers, and paper in a separate area from the play environment during free-play. The researcher instructed the children in aerobics at the day care center six months prior to the study, so the children were used to her presence.

The study occurred over a five week period (Figure 1). During the first week, base-line data were collected using qualitative naturalistic observations where the children's behavior and language were recorded verbatim by the experimenter during spontaneous play (Neuman & Roskos, 1990). The literacy behaviors that were noted involved specific literacy activities, skills, and knowledge (Appendices A, B, C, & D). Specific literacy activities included scribbling, copying, tracing, paper handling, pretending to read, book handling, and storytelling. Noted literacy skills included manipulating a writing instrument, letter / word recognition, and predicting / inferring. Noted knowledge of literacy in context included such activities as a child signing a check at the office, writing a shopping list in the

Figure 1. A Time Line of the Procedures Enacted During
the Five Week Period

	<u>Week</u>				
	1	2	3	4	5
Teacher Guided Subjects	B	T	E	E	P
Subjects Without Teacher Guidance	B	E	E	E	P

B - Base-line data collected.
 E - Enriched environment experienced.
 T - Teacher guidance experienced.
 P - Post-observations noted.

kitchen, or reading a letter at the post office. Quotations mentioning knowledge of literacy were also noted. "It has words," "make a note," "sign up," "scribble," "print," "write it down," and "make a ticket" are examples.

Wide areas of the play environment were partitioned using tables and shelves to create four play centers, a post office, library, office, and kitchen. The post office and library were created in close proximity to each other to promote movement and to develop interrelated play themes between them. Likewise, the kitchen and office were established in close proximity to each other. Labels with environmental print and symbolic forms (pictures) were posted on such things as storage bins. Literacy props, mentioned in the material section of this paper, were placed in appropriate centers.

The six subjects were exposed to the redesigned play environment for one half hour daily during the morning. Three of the subjects received teacher guidance / modeling while they played during the first week of treatment. Teacher guidance involved the teacher participating in play to provide children with explicit information about the setting and props and modeling how the children could use the props to create pretend play and foster literacy behaviors (Isenberg & Jacob, 1983). These three subjects experienced the literacy-enriched play

environment without teacher guidance the next two weeks. The remaining three subjects experienced the enriched play environment without teacher guidance at a different morning time than the experimental group. During each group's exposure to the play area, the part of the room used for the experimental play centers was "off limits" for the remaining children in the day care center. The experimental and control groups did not experience the play environment at the same time.

After three weeks of exposure to the redesigned play environment, observations of the children's literacy behaviors were noted while they played in the enriched environment (Appendices A, B, C, & D).

Analysis of Data

The systematic induction of identifiable patterns of behavior and variables related to these patterns was determined and used to assess whether there are differences in emergent literacy behaviors between a teacher guided literacy-enriched play environment and a literacy-enriched play environment without teacher guidance.

Chapter IV

Analysis of Data

Hypothesis

There are differences in emergent literacy behaviors in four-year olds between a teacher guided literacy-enriched play environment and a literacy-enriched play environment without teacher guidance.

Comparison of Base Line Observations Between the Treatment and Control Groups

Base line observations were examined to determine if the subjects exhibited similar behaviors before the treatment was experienced. The base line data indicated similar behaviors between the control and treatment groups (Appendices A,B, & C).

The boys in each group did not exhibit literacy behaviors, and the literacy behaviors displayed by the girls in both groups were limited. The girls in each group demonstrated the ability to manipulate a writing tool. Alyssa (T) And Liz (T), treatment group subjects, were passive in their literacy behaviors in that they listened to stories being read (Appendix A). Kelly (C), a subject in the control group, pretended to read two times. ("T" designates treatment group subject, and "C" designates

control group subject.)

Post-Observations of the Subjects Who Received Teacher
Guidance Compared to the Control Group

The subjects who received teacher guidance maintained longer sustained literacy play behaviors than the control group, developed themes during play unlike the control group, role played unlike the control group, and interacted with their peers more than the control group.

Jessica and Kelly (C), exhibited literacy behaviors that did not develop into themes; whereas the subjects receiving teacher guidance carried a literacy activity from one setting to another, developing a theme. Alyssa (T) typed a letter at the office and took the letter to the post office to send. Liz (T) pretended to read a recipe to cook dinner. She wrote a letter about her day's events (including making dinner), read the letter, and took it to the post office to send. Steve (T) wrote letters that he delivered to Liz (T) and Alyssa (T). Because themes were developed by the subjects who experienced teacher training, the subjects maintained longer sustained literacy play behaviors. They did not jump from one unrelated activity to another, but developed themes that sustained their attention to interrelate reading and writing meaningfully and establish a chain reaction between the four play

centers. (Appendix C)

The subjects who experienced teacher guidance enacted role playing, unlike the control group. Liz (T) pretended to be the mom, Steve (T) pretended to be the husband and postman, and Alyssa (T) pretended to be the daughter and secretary. The children kept these roles from day to day. In fact, Steve (T) would remind each of them of their roles before they started to play in the centers each day.

(Appendix C)

The subjects experiencing teacher guidance interacted with one another unlike the control group subjects. Liz (T) communicated with Steve (T) because he was her husband and postman. Steve (T) communicated with Liz (T) because he was her dad and postman. It appears that the reason the subjects interrelated with one another was because thematic role playing was developed. (Appendix C)

Interpretation of Hypothesis

There were differences in literacy behavior in four-year olds between a teacher guided literacy-enriched play environment and a literacy-enriched play environment without teacher guidance. The subjects who received teacher guidance maintained longer sustained literacy play behaviors than the control group, developed themes during play unlike the control group, role-played unlike the control group, and interacted with their peers more than the control group.

Chapter V

Conclusions and Implications

Conclusions

This study suggests that a guided literacy-enriched environment is more beneficial for literacy usage than a literacy-enriched environment without teacher guidance, which provides further support for Mandel, Morrow, and Rand's (1991) study. A literacy-enriched environment without teacher guidance did not seem to promote optimal literacy behaviors. Their literacy behaviors were more sustained, thematic, and role oriented compared to the subjects experiencing the literacy-enriched environment without teacher guidance. The teacher's modeling seemed to motivate and direct the children's behavior. Children seemed to be motivated and directed to be like a grown-up.

Implications for Classroom Teachers

This study emphasizes the importance of a literacy-enriched environment as well as teacher guidance within that enriched environment. Because of the findings of this study as well as the findings of previous researchers cited in the literature review section of this study, educators should provide and model opportunities in a

literacy-enriched environment to ensure optimal use of literacy materials.

Staff development, through organized workshops, needs to take place to demonstrate setting up play centers and techniques for guiding preschool children in interacting with literacy during play.

Implications for Further Research

Since teacher guidance is beneficial, guidelines for modeling play behaviors should be established. Research in terms of parental guidance / modeling of literacy in enriched play centers would be beneficial as well, especially since children are exposed to their parents at a young age and for a long period of time.

Further research needs to be completed to determine how a play environment can be designed to promote optimal literacy usage. A study comparing children's usage of literacy materials, including the computer, would provide useful information about the materials that would be most functional to include in a literacy-enriched environment. A study comparing children's usage of the four play centers included in this study and other play centers would provide useful information about the play centers that would be most functional to include in a literacy-enriched environment.

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Appendix A

Specific Literacy Activities Observed Before and After Treatment

Section I - Control Subjects

Jessica's Before Treatment Behaviors

1. Folded paper.

Jessica's After Treatment Behaviors

1. Pretended to read the words on a plaque two different times.
2. Pretended to read a book in the library setting.
3. Pretended to read coupons.
4. Looked through books at the library and said "Day care has this book, but I don't."
5. She looked at a symbol she typed with the typewriter and said, "There's a square with a name in it." She referred to the alphabet letter as a name. She later identified another alphabet letter that she typed as a name.
6. Made writing marks on note card with marker. Made more marks later.
7. Wrote mom a letter.

Kelly's Before Treatment Behaviors

1. Pretended to read a book to self.
2. Pretended to read a book to pretend person / people.

3. Turned pages in book.
4. Folded paper.

Kelly's After Treatment Behaviors

1. Pretended to read coupons.
2. Looked through a book because she said she wanted to find out what it was about.
3. Flipped through the library cards in the card catalogue in the library setting.
4. Typed her name.
5. Typed her name again along with nonsense words.
6. Wrote a letter to mail.
7. Wrote her mom a letter to mail.
8. Wrote her mom ten short notes on index cards to mail.

Nick's Before Treatment Behaviors

Did not exhibit specific literacy behaviors.

Nick's After Treatment Behaviors

Used the typewriter but it probably was used as a toy rather than to convey a message. He played with the dishes in the kitchen and watched other children play with literacy materials.

Section II - Treatment Subjects

Alyssa's Before Treatment Behaviors

1. Listened to a story being read by a teacher.
2. Turned pages in a book.

Alyssa's After Treatment Behaviors

1. Took money and coupons to store and pretended to buy items on coupons.
2. After she got home from the store, she helped Liz cook dinner using recipe book.
3. After dinner, she wrote a letter about her day, pretended to read the letter, and took it to the post office to give it to the postman to mail.
4. Went to the office to type. She wrote telephone messages down on post-it notes. She took her typed letters to the postman, Steve.
5. Steve gave Alyssa mail that she opened and pretended to read.
6. Alyssa went through this thematic play ritual the following days, being the typist and telephone message taker.
7. She went to the library during lunch breaks to sign out books and pretend to read.

Liz' Before Treatment Behaviors

1. Immediately went over to bookshelf after breakfast, but left the bookshelf without picking up any books.
2. She carried a book brought from home. She would not let anyone else touch it. She shared pictures with examiner. She was persistent in getting someone to read to her, asking four different teachers. She finally did get someone to read to her.

Liz' After Treatment Behaviors

1. She pretended to be the mom. She wrote a letter to her mom. She read it and then took it to the post office. She paid for a stamp and gave the letter to the postman, Steve.
2. She went home to cook dinner for Steve, her husband. She followed a recipe from a cookbook.
3. Steve, the postman, delivered mail to her. She opened the mail and pretended to read it.
4. She went to see Alyssa at the office. She borrowed the typewriter to type a letter. She said the alphabet letters as she typed. She put the letter in an envelope and took it to the post office to mail.
4. She then went to the library to sign out books.

Steve's Before Treatment Behaviors

Did not exhibit specific literacy behaviors.

Steve's After Treatment Behaviors

1. Spent the time at the post office as the postman. At the beginning of each play session, he said, "I'm the postman, Liz is the mother, and Alyssa is the daughter." He did not tire of stamping mail and delivering it. When he was not tending to someone else's mail, he wrote his own notes and mailed them.

Appendix B

Literacy Skills Observed Before and After Treatment

Section I - Control Subjects

Jessica's Before Treatment Behaviors

1. Colored.

Jessica's After Treatment Behaviors

1. Colored.
2. Made writing marks on note card with marker. Made more marks later. Wrote letter "P" and said it was her name.
3. Identified the "P" sticker.
4. Wrote mom a letter.

Kelly's Before Treatment Behaviors

1. Colored.

Kelly's After Treatment Behaviors

1. Wrote alphabet letters with pen three times.
2. Wrote a letter.
3. Wrote her mom a letter.
4. Wrote her mom ten short notes on index cards.
5. Recognized letter "A" and "B" stickers.

Nick's Before Treatment Behaviors

Did not exhibit literacy skills.

Nick's After Treatment Behaviors

Did not exhibit literacy skills.

Section II - Treatment Subjects

Alyssa's Before Treatment Behaviors

1. Colored.

Alyssa's After Treatment Behaviors

1. Wrote letters.
2. Wrote telephone messages.
3. Signed out library book.

Liz' Before Treatment Behaviors

1. Colored two times.
2. Wrote her name two times.
3. Wrote "2."

Liz' After Treatment Behaviors

1. Wrote letters. She wrote one letter to her mom.
2. Wrote telephone messages.
3. Signed a book out of the library. She wrote a "t" and two "i's" to sign the book out. She said the letters as she signed the book out. She signed two more books out.
4. Typed a letter, saying the alphabet letters as she typed.

Steve's Before Treatment Behaviors

Did not exhibit literacy skills.

Steve's After Treatment Behaviors

1. Wrote several notes to be mailed.

Appendix C

Knowledge of Literacy in Context Observed Before and After Treatment

Section I - Control Subjects

Jessica's Before Treatment Behaviors

Did not exhibit knowledge of literacy in context.

Jessica's After Treatment Behaviors

1. Looked through books at the library and pretended to read a book.

Kelly's Before Treatment Behaviors

Did not exhibit knowledge of literacy in context.

Kelly's After Treatment Behaviors

1. Looked through a book in the library setting to find out what it was about.
2. Wrote some notes to mail at the post office.

Nick's Before Treatment Behaviors

Did not exhibit knowledge of literacy in context.

Nick's After Treatment Behaviors

Did not exhibit knowledge of literacy in context.

Section II - Treatment Subjects

Alyssa's Before Treatment Behaviors

Did not exhibit knowledge of literacy in context.

Alyssa's After Treatment Behaviors

1. Took money and coupons to store and pretended to buy items on coupons.
2. After she got home from the store, she helped Liz cook dinner using recipe book.
3. After dinner, she wrote a letter about her day, pretended to read the letter, and took it to the post office to mail.
4. Went to the office to type. She wrote telephone messages down on post-it notes. She took her typed letters to mail them.
5. She received mail from the postman and read it.
6. She went to the library during lunch breaks to sign out books and pretend to read.

Liz' Before Treatment Behaviors

Did not exhibit knowledge of literacy in context.

Liz' After Treatment Behaviors

1. Wrote a letter to her mom. She read it and then took it to the post office. She paid for a stamp and gave the letter to the postman.
2. She went home to cook dinner for Steve, her husband. She followed a recipe from a cookbook.
3. She opened mail that was delivered to her and pretended to read it.

4. She went to visit Alyssa at the office. She borrowed the typewriter to type a letter. She put the letter in an envelope and took it to the post office to mail.
5. She then went to the library to sign out books.

Steve's Before Treatment Behaviors

Did not exhibit knowledge of literacy in context.

Steve's After Treatment Behaviors

1. He pretended he was the postman. When he was not stamping mail and delivering it, he was writing notes to send.

Appendix D

Quotations Mentioning Knowledge of Literacy Observed Before and After Treatment

Section I - Control Subjects

Jessica's Before Treatment Behaviors

Did not mention any words to convey knowledge of literacy.

Jessica's After Treatment Behaviors

1. "Day care has this book, but I don't."
2. "I'm going to write some mail."
3. "I'm writing something for mom."
4. "I've got the letter 'P' sticker."
5. "I wrote my name."
6. "I wrote my two names."
7. "There's a square with a name in it."
8. "There's a square without a name in it."

Kelly's Before Treatment Behaviors

1. "My picture is mail."

Kelly's After Treatment Behaviors

1. "That's my name."
2. "One note done."
3. "Tell me something to write."
4. "What does the mail say?"

5. "I am going to write something because I am the mail person."
6. "I can't find the letter I wrote."
7. "What's this book about?"

Nick's Before Treatment Behaviors

Did not mention any words to convey knowledge of literacy.

Nick's After Treatment Behaviors

Did not mention any words to convey knowledge of literacy.

Section II - Treatment Subjects

Alyssa's Before Treatment Behaviors

Did not mention any words to convey knowledge of literacy.

Alyssa's After Treatment Behaviors

Did not mention any words to convey knowledge of literacy.

Liz' Before Treatment Behaviors

Did not mention any words to convey knowledge of literacy.

Liz' After Treatment Behaviors

1. "I've got to sign the book out."
2. "Need 't' and two 'i's"
3. "I need a pen to sign this book out."

4. "I need to stamp the book with words."
5. "The recipe says I need carrots and celery to make soup."

Steve's Before Treatment Behaviors

Did not mention any words to convey knowledge of literacy.

Steve's After Treatment Behaviors

1. "I have to stamp the mail with words."
2. "I've got to write a letter to send."
3. "I'm the mailman. I wrote something for you, and you have to read all of this."