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ABSTRACT

A study examined the effects of literacy-enriched play settings on preschoolers' literacy behaviors in spontaneous free play. Subjects were 91 children, ages 3-5, from 2 urban day care centers. Prior to, and following the intervention, the frequency of each child's handling, reading and writing behaviors in play was assessed through direct observation. Videotaped samples of play areas, collected throughout the study, examined the nature of children's play themes and their uses of literacy objects in play. Following baseline observations, the physical environment of one of the day care centers was enriched with literacy objects in three distinct play centers: kitchen, office, and library. Significant differences were recorded for the experimental group in the frequency, duration, and complexity of literacy demonstrations in play. Further, children in the experimental group incorporated literacy objects in more diverse and functional ways in their play using more explicit language than the control group. Findings suggests that, with literacy-enriched settings, play may become an increasingly important context for children to discover and explore the nature of written language. (Seven tables of data and 4 figures are included; 45 references are attached.) (Author/MG)

Literacy Objects as Cultural Tools:
Effects on Children's Literacy Behaviors in Play

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Abstract

This study examined the effects of literacy-enriched play settings on preschoolers' literacy behaviors in spontaneous free play. Ninety-one children, ages 3-5, from two urban day care centers participated in the study. Prior to, and following the intervention, the frequency of each child's handling, reading and writing behaviors in play was assessed through direct observation. Videotapes samples of play areas, collected throughout the study, examined the nature of children's play themes and their uses of literacy objects in play. Following baseline observations, the physical environment of one of the day care centers was enriched with literacy objects in three distinct play centers: Kitchen, Office, and Library. Significant differences were recorded for the experimental group in the frequency, duration, and complexity of literacy demonstrations in play. Further, children in the experimental group incorporated literacy objects in more diverse and functional ways in their play using more explicit language than the control. These findings suggest that, with literacy-enriched settings, play may become an increasingly important context for children to discover and explore the nature of written language.

Literacy Objects as Cultural Tools: Effects on Children's Literacy Behaviors in Play

As a medium for exploration, play has been described as providing a "courage all its own" (Bruner, 1983). Liberated from situational constraints, children in play are free to construct micro-worlds in which actions and objects are not what they appear to be. For example, in the play context a toy block may become a telephone or a car or whatever meaning is instrumental to the sequence itself. In so doing, the child is using and manipulating representations or symbols to express meaning. Through this transformational behavior, children are thought to begin to separate meaning from objects, providing the foundation for understanding other representational systems like written language (Piaget, 1962; Vygotsky, 1962).

Separation of thought from objects is preceded, according to Vygotsky (1962; 1967), by a transition period during which the child uses one concrete object as a substitute for another. The object serves as a pivot precipitating the shift from "things as objects of action," to "things as objects of thought." To anchor the transformation, the process appears to initially require a relatively prototypical context with common objects, i.e. good exemplars of a general category (Fein, 1975). Once children's mental representations are well established, objects and contexts may be replaced by more abstract forms.

Experimental studies in free play settings generally confirm Vygotsky's hypothesis in the use of objects as substitutes or

"meaning-markers." Young children tend to show richer and more elaborated sequences of play with highly prototypical objects (Fein & Robertson, 1975; McLoyd, 1983). Correspondingly, there is some evidence that the relationship of pretend behavior to object prototypicality may change between 4 and 8 years old when children's language becomes explicit enough to convey the meaning of objects without their physical presence (Pulaski, 1973).

While much of the research on objects has concentrated on the quality of pretend play (Chaille, 1978; El'Konin, 1966), a number of recent studies have focused on how the uses of objects and symbolic transformation in play contexts may influence children's emerging conceptions of literacy (see reviews by Christie & Johnsen, 1983; Pellegrini, 1985). One type of analysis, for example, looks at the transformational process in general and examines the predictive relations between symbolic play and early literacy. This research is based on the theoretically demonstrated parallels between the use of symbols in play and signs in emergent reading processes (Pellegrini, 1980; 1985). Recent longitudinal studies by Pellegrini and his associates (Galda, Pellegrini & Cox, in press; Pellegrini, Galda, Dresden & Cox, 1990), however, report that children's engagement in symbolic play does not appear to significantly predict emergent reading status, suggesting that transformational activity in play, per se, may not represent the pivotal means toward competence in literacy.

A second type of analysis has focused more closely on the

object and the nature of children's play activity. This research is based on the premise that by using prototypical literacy-related objects in play environments, young children will engage in "run-ups" to literacy (Bruner, 1984) in their early attempts to understand the rules of discourse. Research of this type was initiated on the basis of observational studies documenting children's natural engagement in literacy-like tasks in play (Jacob, 1984; Neuman, in press; Roskos, 1987).

Most surveys, however, indicate that there is a paucity of print-rich materials in preschool settings designed to facilitate natural interactions with written language (Morrow, 1990; Robinson, 1990, Schickedanz, 1986). Consequently, to examine the influence of objects on children's emerging concepts of literacy, several studies have attempted to enrich particular play centers with literacy materials (Neuman & Roskos, 1990a; Morrow, in press; Vukelich, 1989). Vukelich (1989), for example, transformed two play centers into a flower shop, and a bank, with literacy materials including withdrawal slips, instructions on how to use a MAC machine and loan application forms; similarly, Morrow (in press) created a veterinary corner, with forms and books to accompany the play. However, while demonstrating more literacy-related play, it is not clear whether the types of centers and their related objects in these studies actually represent objects of meaning to young children. Thus, the utility of these objects in building up stores of represented meanings to be used at some later time in the more abstract form

of written language may be limited.

In contrast, this research was designed to analyze the impact of inserting common literacy-related objects in prototypical contexts on preschooler's literacy behaviors in spontaneous free play. The literacy objects were designed to serve as pivots for children to develop an array of new strategies, associations, and behavioral prototypes that subsequently might be used in other outside contexts. Further, we questioned whether the inclusion of typical literacy objects in play environments might produce more sustained and elaborated sequences of literacy in play, as reported in our previous research (Neuman & Roskos, 1990a; 1990b). Specifically then, the study was designed to answer the following questions:

a) Do play centers enriched with literacy objects influence the frequency of literacy demonstrations in the spontaneous play of preschoolers?

b) Does the inclusion of literacy objects in play environments influence the duration and complexity of literacy-related free play?

c) How are the literacy objects used in children's spontaneous play?

Studies of ecological influences in children's play have noted the important distinction between play and exploration with objects (Berlyne, 1960; Hutt, 1979). Reflecting a locus of control factor, in exploration the child asks, "What can this object do?", whereas in play, the question becomes, "What can I

do with this object?" Over time, exploration, which is dominated by children's actions, is thought to decrease while the amount of time playing with an object, using more explicit language, is said to increase (Hutt & Bhavnani, 1976). Consequently, this research was conducted over a seven month period to allow sufficient time for the novelty effects of objects to wear off.

Method

Subjects and setting

Ninety-one preschoolers, ages 3-5 years old, from two day care centers in an urban metropolitan area participated in the study. Each center served families from diverse ethnic backgrounds; the sample included 62% Caucasian, 31% Black, 5% Southeast Asian, and 2% Hispanic children.

A director administered both day care centers, located in close proximity to each other. Both programs were state licensed and met the accreditation standards of the National Academy of Early Childhood Programs. Each program included a teacher-to-child ratio of 1:10, a planned curriculum incorporating science, social studies, language, art and motor coordination activities integrated throughout the day, and approximately 180 minutes per day for indoor and outdoor free play.

The sites were similar in their physical organization of space. Book corners, housekeeping, blocks, small manipulatives, and art centers were placed around the perimeter of each classroom with a large open space in the middle of the room. Although typical play objects were plentiful in both sites, few

literacy-related objects, aside from books in the book corner and paper at the arts and crafts table, were readily accessible to children. Both centers, however, did include some print displays such as the alphabet, chart stories, and lists of children's names.

Centers were randomly selected into experimental and control sites. Forty-six children (24 boys; 22 girls), with a mean age of 3.68, were in the experimental site and 45 children (25 boys; 20 girls), mean age 4.17, were at the control site.

To obtain some measure of prior knowledge in literacy, the Test of Early Reading Ability (TERA) (Reid, Hresko & Hammill, 1981) was individually administered to each child in the sample. A t-test indicated no statistically significant differences between treatment and group groups (t=1.23, df=83, n.s.).

Procedures

Prior to the intervention phase of the study, two measures of literacy behavior in play were obtained to examine the frequency of literacy demonstrations in preschoolers' spontaneous play and the uses of literacy-related objects in four play settings.

Four graduate students in early childhood education and reading were trained over three one-hour sessions to observe and record the number of literacy demonstrations each child engaged in during free play. Literacy demonstrations (Neuman & Roskos, 1990b; Roskos, in press) were defined as instances of handling (focusing on the physical exploration of a literacy object),

reading (attributing meaning to printed marks or symbols), and writing (attempting to use printed marks as a form of communication.) Using videotapes from earlier research (Neuman & Roskos, 1990b), observers practiced identifying and tallying observable demonstrations in each category. Intercoder reliability indicated .97 agreement between observers following the training period.

Over a two-week period, each child's play was observed and the number of literacy demonstrations was tallied during four 15-minute segments of spontaneous play, for a total of 60 minutes of play observed per child.

To examine the uses of literacy-related objects, children's spontaneous play activity was videotaped for 30 minutes, four different times, in four different areas: housekeeping, book corner, art table, and small manipulatives, for a total of two hours per play area. Rather than focus on an individual child, the goal of the videotaping was to obtain samples of children's play themes and their uses of objects in play.

Videotaping was conducted by two graduate students in communications who had previous experience in videotaping play behavior in early childhood settings. Both had been trained to identify play themes, using videotapes and transcripts from earlier research (Roskos, 1987). Prior to the data collection period, both familiarized themselves with the sites, noting play tendencies and potential technical problems, such as light levels, traffic patterns during play time, and acoustics. Based

on this information, a strategy was developed for videotaping play themes as they naturally occurred in both experimental and control sites.

Using a camcorder and a microphone system [1], the two worked in tandem, skirting a pre-selected play area for a 30-minute time period. If the children began a play topic, but then abandoned it in less than 30-minutes, the two remained in the area to fulfill the time period. If the children initiated a play theme, then left the area to pursue it, the pair would follow the children in an effort to capture the play action and language. Thus, it was possible for the video recorders to successfully video children's play actions and language as they naturally occurred without confining children's play to predetermined areas, or requiring them to wear individual microphones.

Intervention Design

Investigations of play activity reveal that children create play contexts, situations, and plans based on what they already know, using objects to support this endeavor (Bruner, 1983; Fein, 1975; Garvey, 1977). Studies indicate that spatial organization, the functional complexity of play materials, and classroom organization influences the quality of play in an environment (Hutt, 1979; Emmerich, 1977; McLoyd, 1983; Proshansky & Wolfe, 1975). Specifically, the more familiar the children are with play contexts and their corresponding objects, the more they tend to play in increasingly complex ways, using elaborated language in the process.

Considering the importance of familiarity, informal discussions were held with day care teachers and with parents to determine what literacy contexts and objects were already known to the children. In addition, pre-intervention videotapes were scanned to note children's play preferences, interests and instances of literacy behaviors. Such information provided clues as to potential play settings, literacy objects, and spatial arrangements which might be particularly appealing and familiar from the child's point of view.

Based on existing research and specific site-based information, three principles of design were established in planning the literacy enrichment in the experimental site.

Principle #1: For literacy enrichment purposes, the play space should be arranged so as to encourage sustained play interactions, yet allow for adequate adult presence and supervision.

Research on the characteristics of play environmental design has demonstrated that small, intimate play areas encourage more interactive and sustained play activity (Neill, 1982; Zifferblatt, 1972). Day care teachers in our study, however, expressed concern that if play spaces were too "private," they could not adequately monitor children's play activities. To accommodate these concerns yet allow for more intimacy in various play areas, the play space was more sharply defined, using semi-fixed features such as cupboards, screens, tables, directional signs, and hanging mobiles.

In addition, items in the children's play environment were inventoried and labelled in ways that resembled real world print

displays. For example, storage bins for small manipulatives were identified by print and picture much like hardware store items. Art materials were identified by means of a large chart which contained printed names of items and their corresponding pictures. Teachers were also encouraged to display the children's drawings and writing attempts throughout the play environment. Directional signs (words + pictures + arrows) were strategically placed about the environment to serve as reference points for locations. In these ways, the environment was spatially organized using print and picture.

Principle #2: The literacy enrichment should include play settings that reflect authentic literacy contexts in the children's real-world environment and are natural adaptations of existing play areas.

Since young children seem to play best about what they know, literacy-enriched play settings were created that reflected real-life literacy situations for these children. For instance, parents and teachers reported that the children had considerable background about libraries and offices, having frequently visited these settings as a part of their day care and real world experiences. Many of them, however, had much less experience with post offices or banks, since they spent most of their day in the day care setting.

Further, concerned that abrupt changes in play areas might prove overwhelming to the children, it was suggested by day care teachers that rather than create a totally new environment, existing centers be modified or enhanced to include more literacy. Based on these considerations, three play settings were

developed: The Kitchen/House, the Cozy Corner Library and the Office. These centers resembled contexts where children might have witnessed or experienced literacy activities as reported by their parents and day care teachers. In this respect, they were designed to capitalize on print contexts already known to the children.

Principle #3: The literacy enrichment should include a network of common literacy objects in appropriate contexts that are safe for children to use.

Since object familiarity appears to be instrumental in the early phases of symbolization and meaning-making (Vygotsky, 1962), literacy objects that were considered prototypical of children's experiences in similar contexts in their daily lives became an essential criterion. For example, items in the Kitchen/House Center included cookbooks, coupons, recipe cards, actual grocery packages, children's books, and materials for list-making, such as pencils and notepads. In short, we attempted to insert familiar literacy objects into equally familiar print-based contexts for these children, with the idea that these ecological factors might "assist" children's meaning-making with literacy in their play.

Three additional criteria drawn from our earlier work also guided the insertion of literacy objects into each play center: appropriateness (naturally and safely used by young children), authenticity (a real item in the child's general environment), and utility (usefulness to children in their imitative literacy attempts) (Neuman & Roskos, 1990a). Table 1 gives a complete

listing of the literacy objects inserted into each play setting.

Insert Table 1 about here

No changes in the play environment were made at the control site; teachers were encouraged to organize play areas "as usual." Floor plans illustrating the design differences in the play environments of the experimental and control sites are shown in Figures 1 and 2.

Insert Figures 1 and 2 about here

During free play periods, teachers and aides in both sites were encouraged not to restrict any play areas, but to allow children to freely move about all the play centers. The role of the adult in these sites focused on setting the stage and observing children's play; rarely did they directly intervene in the play activity.

Over the next six months, videotaped samples of children's spontaneous free play in the newly established kitchen/house, library and office centers at the experimental site and the housekeeping, book corner, arts and crafts table at the control site were collected weekly, using similar procedures as in the pre-intervention phase, throughout the study for a total of 18 hours of videotaped play per site.

During the final two-week period of the study, each child's

spontaneous play activity was systematically observed once again using the same pre-intervention procedure. Eighty-five children, comprised the final N of the study, representing a loss of 7% of the sample due to child absences and family relocations.

Data analysis

Frequencies of children's handling, reading and writing behaviors were tallied prior to and following the intervention to determine the influence of literacy enrichment on the number of literacy demonstrations in children's spontaneous free play. A one-way analysis of covariance was conducted, with the corresponding pretreatment score serving as covariate, for each category of response.

Videotaped play activity was qualitatively analyzed to examine the duration and complexity of children's play sequences with print, and the function of literacy objects in these settings. Through repeated viewings and discussion, 44 hours of videotaped play (8 hours baseline; 36 hours throughout study) were scanned and play frames--defined by Sutton-Smith (1971) as play that is bound by a location and a particular focus or interaction--were established. This analysis yielded 216 play frames.

These play frames were examined for evidence of literacy behaviors--handling, reading or writing activities. Of the 216 frames, 74 or 34% were literacy-related. Each was numbered by date, and grouped by site into three clusters: baseline, mid-intervention, and late intervention play frames.

Five representative play frames from each cluster in the experimental and control groups were selected for subsequent analysis to examine the influence of literacy enrichment on the duration and complexity of the literacy-related play. Duration was calculated by determining the amount of time children spent on literacy-related play in each play frame. Complexity was analyzed by counting the number of individual literacy demonstrations within each play frame (i.e. specific instances of handling, reading, or writing). Contingent sequences of play behavior are regarded by play researchers (Sylva, Roy & Painter, 1980) to provide the best empirical evidence of complexity. As reported in our previous research, contiguous sequences of literacy demonstrations indicated more complex literacy-related play (Neuman & Roskos, 1990b).

Finally, play frames were transcribed verbatim, including children's talk, gesture, physical action and object use to examine how literacy objects functioned in the play frame itself. Since researchers have shown that specific changes in context result in specific changes in language used (Halliday, 1975), the frames were coded according to the type of speech acts and actions the preschoolers used and their purpose in relation to literacy objects.

Each play frame was divided into behavioral units, defined as individual segments of speech or specific action that served one of the roles in a play exchange: requestives, responsives, performatives, and nonverbal Actions. This typology was derived

from Dore, Gearhart & Newman's (1978) extensive observations of young children's speech acts in preschool classrooms. Actions were included because interactions between children are thought to be first through gesture and action, and then through symbol. Language is seen as very much predicated on gesture (Lock, 1978).

Each behavioral unit was also analyzed for its reference to a literacy object. For example, picking up a recipe card and attempting to read it, was coded as using the object to engage in "pretend reading." Through repeated readings of transcripts, categories of uses were established. By cross-referencing speech acts and action behavioral units with the uses of objects, it was possible to analyze in what ways literacy related play was extended through the uses of objects. Further, it allowed us to examine the extent to which the objects might influence a variety of linguistic repertoires (see Tables 2 and 3 for coding system).

Insert Table 2 about here

Insert Table 3 about here

Each segment was coded holistically for gist, which according to Corsaro (1979), yields an accurate measure of a behavioral unit for preschool children. Transcripts were coded by one of the authors, then reviewed by the other to ensure consistency of coded categories. Disagreements were resolved

through discussion. A sample coded transcript is provided in the appendix.

In total, 325 behavioral units were reported for the experimental group; 111 for the control group. In order to examine potential differences in the uses of literacy objects, these frequencies were converted to percentages. Due to the relatively limited number of literacy-related behavioral units from the control group, data were collapsed across all three time periods. Following a procedure developed by Alvermann and Hayes (1989), we constructed a matrix of literacy object use as revealed through language and action during play.

Results

Frequency of literacy demonstrations

Our first analysis was designed to measure differences between groups in the number of literacy demonstrations in children's spontaneous free play. Table 4 presents the mean scores for the pretreatment frequencies and the adjusted means for the posttreatment scores on the number of handling, reading, and writing literacy demonstrations.

Insert Table 4 about here

Significant differences were reported in each category of response. Children in the experimental group engaged in significantly more handling (F (1,82) = 29.99, $p < .000$), reading (F (1,82) = 13.43, $p < .000$), and writing (F (1,82) = 26.89, $p <$

.000) demonstrations in play than those children in the control group. These data indicated that the infusion of literacy objects along with physical design changes in play settings significantly influenced the nature of children's play behaviors.

Duration and complexity of literacy-related play themes

Table 5 presents mean scores for treatment and control groups for the duration and complexity of literacy-related play themes.

Insert Table 5 about here

One-way ANOVAS on the total number of literacy-related play frames in the representative sample indicated statistically significant differences between the two groups, with the experimental group engaging in lengthier (F (1,29)=18.22, p < .000) and more complex literacy-related play (F (1,29)=15.54, p .000), than those children in the control group.

To examine trends across time periods, Figures 3 and 4 displays the average duration and complexity of literacy-related play themes for baseline, mid-intervention and late intervention periods for treatment and control groups.

Insert Figure 3 about here

Insert Figure 4 about here

As expected, only slight differences in duration and complexity of literacy-related play themes were reported for the two groups prior to literacy enrichment. However, following the infusion of literacy-related objects, there were striking differences in both variables. Children in the experimental group engaged in over 10 times the amount of literacy-related play. Related to this trend, there was a marked change in the complexity of play frames, with the experimental group engaging in more contiguous sequences of literacy behavior. Further, these trends were maintained and even extended in the late enrichment period, demonstrating the impact of literacy objects on play, even after the effects of novelty wore off.

In summary, children in the experimental group spent more time engaging in handling, reading and writing activities in play than the control. These demonstrations became more sustained and more interconnected, as literacy was increasingly integrated in children's ongoing play themes over the seven month period of the study.

Children's uses of literacy objects in play

Tables 6 and 7 describe how literacy objects were used in play as communicated by the preschooler's speech acts and actions. Speech acts in each category were aggregated to examine trends between treatment and control groups.

Insert Table 6 about here

Insert Table 7 about here

Children in the experimental group tended to rely more on language in communicating with others in literacy-related play than the control group; only 14% of the play in the experimental group was dominated by nonverbal action compared to 41% in the control. In the control group, for example, meaning was often conveyed through actions, as in one play theme, where we observed a little girl attempting to engage her friend in play by pointing to a paper as if it were a map. In contrast, children in the experimental group more often negotiated meaning through language, as in the following episode:

> Katie: (referring to her book): Here's the name. Oh, no! (She flips through the book.)
> Supraja (looking at the pages): This is a cooking book. This is a cooking book, Katie. That's OK.
> Katie (sweeping her hand across the print): There's words. It's a word book.
> Supraja: A check book!
> Katie (closing the book and smiling): Yeah, like a checkbook.

Closely associated with these trends, the control group's reliance on nonverbal actions was accompanied by more exploratory behavior, as in "what can this object do," in comparison with the experimental group, where literacy was situated in the context of pretend play. For example, children's use of writing instruments (markers, pencils, crayons) in the control group consisted largely of experimenting with the various colors or markings on paper. On the other hand, children in the experimental group

frequently used writing instruments in more functional ways, such as to "write valentines," to record "library" rules, and to write down "directions." In this respect, the literacy behaviors demonstrated by the control group tended to be guided by the object, externally-driven, with action subordinated to the object, whereas those demonstrated by the experimental group were more internally-driven, with action subordinated to the children's intentions.

Children in the experimental group also used literacy objects to engage in a wide variety of literacy behaviors. They focused their interactions on the labelling of objects, reading, writing, and using literacy in their pretend play activities more frequently than the control. For example, children in the control group most often engaged in identifying words and letters seen on the available print such as a calendar or a list of children's names in the classroom. In the experimental group, however, play centers provided a broad diversity of literacy activities, as in the Office, where children spent time preparing and sending mail, writing each other's names, reading messages, and assuming the roles of office workers.

Further, striking differences were reported between groups in the role of the literacy object in play. Though physically present, a good deal of talk and action among preschoolers in the control group made no reference at all to the literacy object, indicating that the object was not the focus of learning and interaction. For example, in one episode, two boys were playing

"sleep" in the library corner, holding books, yet making no mention of the content of the books themselves. Children in the experimental group, however frequently incorporated the literacy objects into their play themes, using them to further their play purposes. For example, the children's use of a "Trapper-Keeper" notebook, became a central prop in a number of family play themes about "doing homework":

> Sharonda: Good afternoon!
> Julia: (carrying the Trapper-Keeper). Oh hello, mother. (Pointing to it) I gotta study for class, Mom.
> Sharonda: Hurry up! We gotta go to Gramma's house.
> Julia: Guess what? I gotta show you something. (She opens the Trapper-Keeper). I gotta bad test! (She shows her a folded piece of paper). Look! I've been studying a lot.
> Sharonda: Don't study tomorrow a really lots. I don't need it.

Finally, contrary to some teachers' beliefs that play with real objects encourages more "real life" play (Paley, 1990), children in the experimental group actually engaged in more object transformations with the literacy props than those in the control group. For example, the children changed cookbooks into "magic, genie books" and pieces of paper into detailed directions for "ballet lessons." These children used literacy objects in creative ways as they pretended to be magicians, mail carriers, librarians, indicating that object prototypicality and familiarity might have actually encouraged more meaningful and imaginative literacy-based play.

In sum, these data indicated that children in the experimental group relied more often on the language of literacy over gestures and actions alone to elicit, respond, and perform

activities in play. In addition, they incorporated literacy objects into their play in more diverse and functional ways. These differences indicate that the physical presence of objects may have assisted children in the use of more explicit language in literacy-based play.

Discussion

From a Vygotskyian perspective (1962), the use of objects in pretend play profoundly influences the development of language and representational thinking. In the course of their imaginative play, children's manipulation of objects is thought to be instrumental in helping them detach meaning from real objects, thus understanding that "action arises from ideas rather than things." As reported by Fein (1975), this gradual process is considered to begin with common objects in relatively prototypical contexts. Consequently, by embedding literacy objects in play settings, our purpose was to encourage children to spontaneously engage in literacy-like behaviors using their prior knowledge, as well as that of their peers, to extend their associations and understandings of literacy.

The results of this study indicate that the deliberate enrichment of the play environment with familiar literacy objects in equally familiar contexts of literacy use, enhanced young children's frequency of literacy activity in play. Over the period of the intervention, both the frequency and duration of these literacy activities increased, suggesting that unlike "toys," these objects enhanced children's self-generated playful

literacy activity, providing richer and more elaborated play sequences. Further, through their language and actions, children's uses of literacy objects became increasingly varied, incorporating a greater repertoire of questions, responses and behaviors involving literacy. These results support the findings of Sylva, Roy and Painter (1980) indicating that more challenging and complex play themes are produced by materials that are instrumental in nature.

Within this enriched play environment, children incorporated literacy objects in their play themes and expressed their ideas about literacy in pretending to be teachers, police officers, librarians, and firefighters among other roles. Together, this constellation of objects--contexts--roles provided a network, luring children into the language and actions of literacy. In this respect, the environment scaffolded the children's "comprehension of the act," of literacy prior to their formal induction via instruction. Wood, Bruner, and Ross (1976) have argued that this form of recruitment is the first stage of scaffolding, to be replaced by later assistance in more and more conventional forms.

Further research focusing on the role of the adult in enhancing preschoolers' literacy-related play is needed to explore how properly timed intervention may assist and enrich play as a medium for literacy learning. Since internal control and intrinsic motivation are fundamental to the definition of play (Garvey, 1977), such adult interactions must be subtly

introduced so as not to disrupt or control the play flow, but to accentuate certain features of the literacy task that are relevant to children.

Findings from this study also indicate the need for certain ecological considerations related to the literacy enrichment of play environments. That the children in the experimental site evidenced more and qualitatively different literacy activities in play appears to be linked more to the conscientious application of environmental design principles than to the simple "littering" of play areas with literacy objects. What seems key, here, is the insertion of known literacy objects embedded within familiar play areas. This kind of "nested" familiarity within well-designed play environments tended to create networks of literacy behaviors easily incorporated into children's naturally-developing play themes. In this manner, literacy objects appeared to serve as pivots (Vygotsky, 1967), supporting the play and assisting the use of language over action as a means of conveying meaning about literacy.

Consequently, the findings suggest that a more calculated approach to the design of literacy enrichment in early childhood play environments is needed--one that uses information from a variety of sources. Specifically, parents need to be surveyed as to the kinds of literacy activities and situations that naturally occur outside the early childhood program; teachers, as well, need to rework play centers to include familiar literacy objects and routines. This implies that literacy-enriched play settings

and objects will vary across programs, reflective of the broader cultures of their participants. In this respect, "travel agen y" and "restaurant" play centers may be appropriate to one ear y childhood environment but not to others, where the generi "offices" and "grocery stores" may more likely represent real-world literacy contexts to children.

In conclusion, this research suggests that children's functional engagement with literacy objects in play may serve a critical role in their early attempts to gain power and control over written language. Through play, children may explore the cultural tools of literacy, making them a functional and valued part of their own personal experience.

1. A Panasonic Camcorder was used for videotaping. Two table-top cordless microphones and a portable mixer were used for audiotaping play talk. One microphone was centrally placed in the play area and the other hand-held by an observer who moved with the children. The observer also controlled the mixer which was positioned near the different videotaped play areas.

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Table 1

Literacy objects used to enrich play centers

Play center	Literacy object
Kitchen	Books to read to dolls/animals
	Telephone books
	A real telephone
	Emergency number decals
	Cookbook
	Blank recipe cards
	Labeled recipe boxes
	Small plaques/decorative magnets
	Personal stationery
	Food coupons
	Grocery store ads/fliers
	Play money
	Empty grocery containers
	Small message board
	Calendars of various types
	Notepads of assorted sizes
	Pens, pencils, markers
Office	Calendars of various types
	Appointment book
	Message pads
	Signs (e.g. open/closed)
	Books, pamphlets, magazines
	File folders
	Racks for filing papers
	In/out trays
	Index cards
	Business cards
	Assorted forms
	Play money
	Ledger sheets
	Typewriter or computer keyboard
	Clipboards
	Post-its/address labels
	Note cards
	Large plastic clips
	Pens, pencils, markers
	Trays for holding items

Table 1 (cont.)

Play Center	Literacy objects
Library	Library book return cards Stamps for marking books A wide variety of children's books Bookmarks Pens, pencils, markers Paper of assorted sizes A sign-in/sign-out sheet Stickers ABC index cards Telephone Telephone books Calendars of various types Posters of children's books File folders

Table 2 Coding system for children's speech acts and nonverbal actions

Category	Code
Requestive: Solicits information or Action	S
Question: Seeks either judgement or information: "Wanna write a valentine?"	
Action Requests: Seeks the performance of an action by hearer: "Give me that book!"	
Suggestions: Recommends the performance of an action by hearer or speaker: "Let's play Librarian"	
Responsive: Supplies Solicited Information	R
Answers: Provides solicited judgement of proposition: "A little boy from China drinked your milk."	
Explannations: States justifications and predictions: "Cause I readed that Chinese book."	
Performative: Accomplishes acts and establishes facts by being said.	P
Claims: Establishes rights of speaker: "That's my letter."	
Declaratives: Announcement of facts or rights of speaker: "I know how to write my name."	
Qualifications: Provides unsolicited information to requestives: "That is not an 'a'."	
Nonverbal: Actions or gestures to express meaning	N

Table 3 Coding system for reference to object

Category	Code
Labeling: A literacy object is identified.	l
Pretending to read: A child attempts to read.	b
Pronouncing words or letters: Specific words or letters are pronounced.	w
Exploring objects: A literacy object is manipulated or handled.	e
Writing: Writing is used to communicate with others.	wr
Transforming: Child assigns new meaning to a literacy object	t
No reference to object. A statement that makes no reference to literacy object.	n
Off/task. A object is used inappropriately	o

Table 4: Means and standard deviations for number of literacy demonstrations

Type of Demonstration	Experimental		Control	
	Pre.	Post.	Pre.	Post.
Handling	1.70 (3.80)	7.30 (6.54)	1.36 (2.90)	1.53 (2.16)
Reading	.56 (1.22)	2.09 (2.32)	1.17 (2.67)	.67 (.82)
Writing	.30 (.86)	2.60 (2.89)	.05 (.22)	.31 (.75)

Table 5 Means and standard deviations for duration and complexity of play themes

Quality of play frames	Experimental		Control	
	M	SD	M	SD
Average Duration (in seconds)	462.73	356.25	66.53	48.10
Complexity (no. of demonstrations in each play frame)	11.60	9.61	1.80	.68

Table 6 Percentage of behavioral units for each speech act or actions and type of reference to the literacy object: Treatment Group

	Speech Act and Actions					
Object References	Request.	Respond	Perform.	Nonverbal	Total	N*
Labelling	2%	4%	9%	2%	17%	55
Pretending to read	1%	2%	15%	2%	21%	68
Pronouncing words or letters	1%	2%	2%	1%	7%	23
Exploring	4%	2%	5%	3%	12%	39
Writing	3%	4%	7%	3%	17%	55
Transforming	2%	8%	8%	2%	20%	65
No Reference to Object	1%	1%	3%	1%	6%	20
Off/task Behavior					0%	0
Total	14%	23%	49%	14%	100%	317

*Number of behavioral units

Table 7 Percentage of behavioral units for each speech act or action and type of reference to the literacy object: Control Group

	Speech Act and Actions					
Object References	Request.	Respond	Perform.	Nonverbal	Total	N
Labelling					0%	0
Pretending to Read				5%	5%	6
Pronouncing words or letters	12%	12%	11%	7%	42%	47
Exploring			2%	18%	20%	22
Writing				1%	1%	1
Transforming		1%		3%	4%	4
No Reference to Object	6%	5%	10%	6%	27%	30
Off/task Behavior				1%	1%	1
Total	18%	18%	23%	41%	100	111

* Number of behavioral units

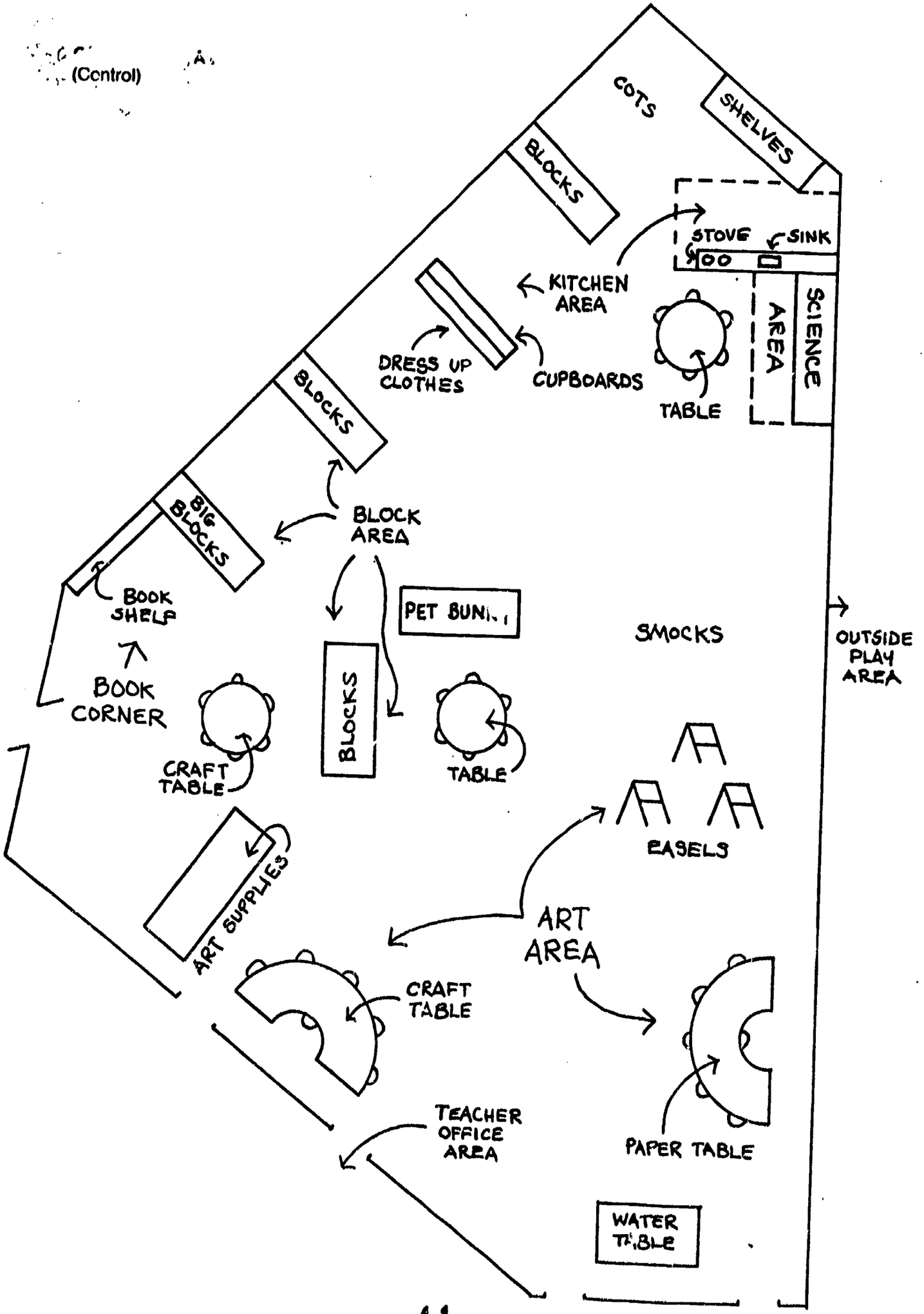
Figure 1: Preschool classrooms prior to enrichment.

Figure 2: Experimental classroom following enrichment.

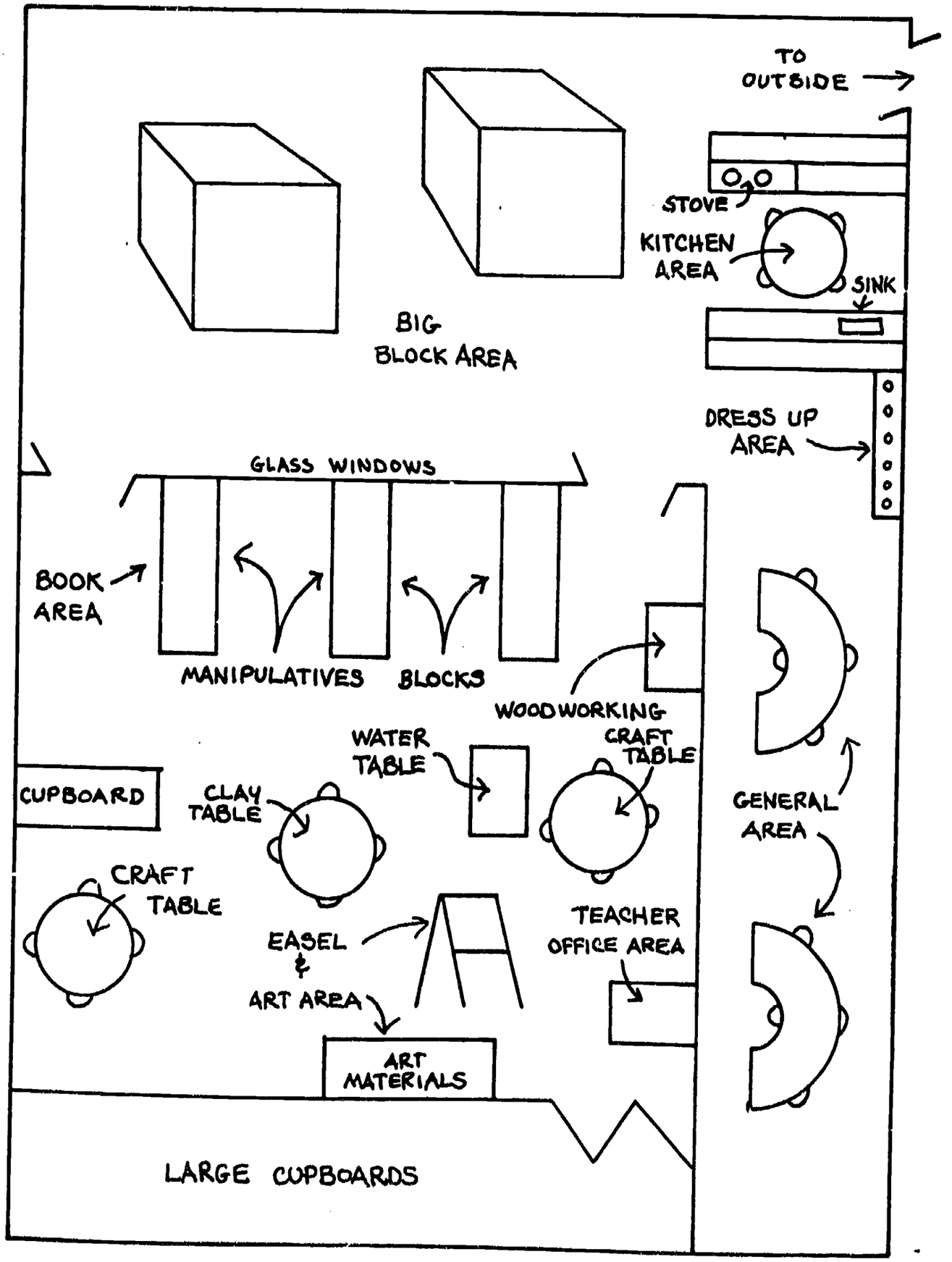
Figure 3: Duration of literacy-related play frames: Baseline, mid-, and late intervention.

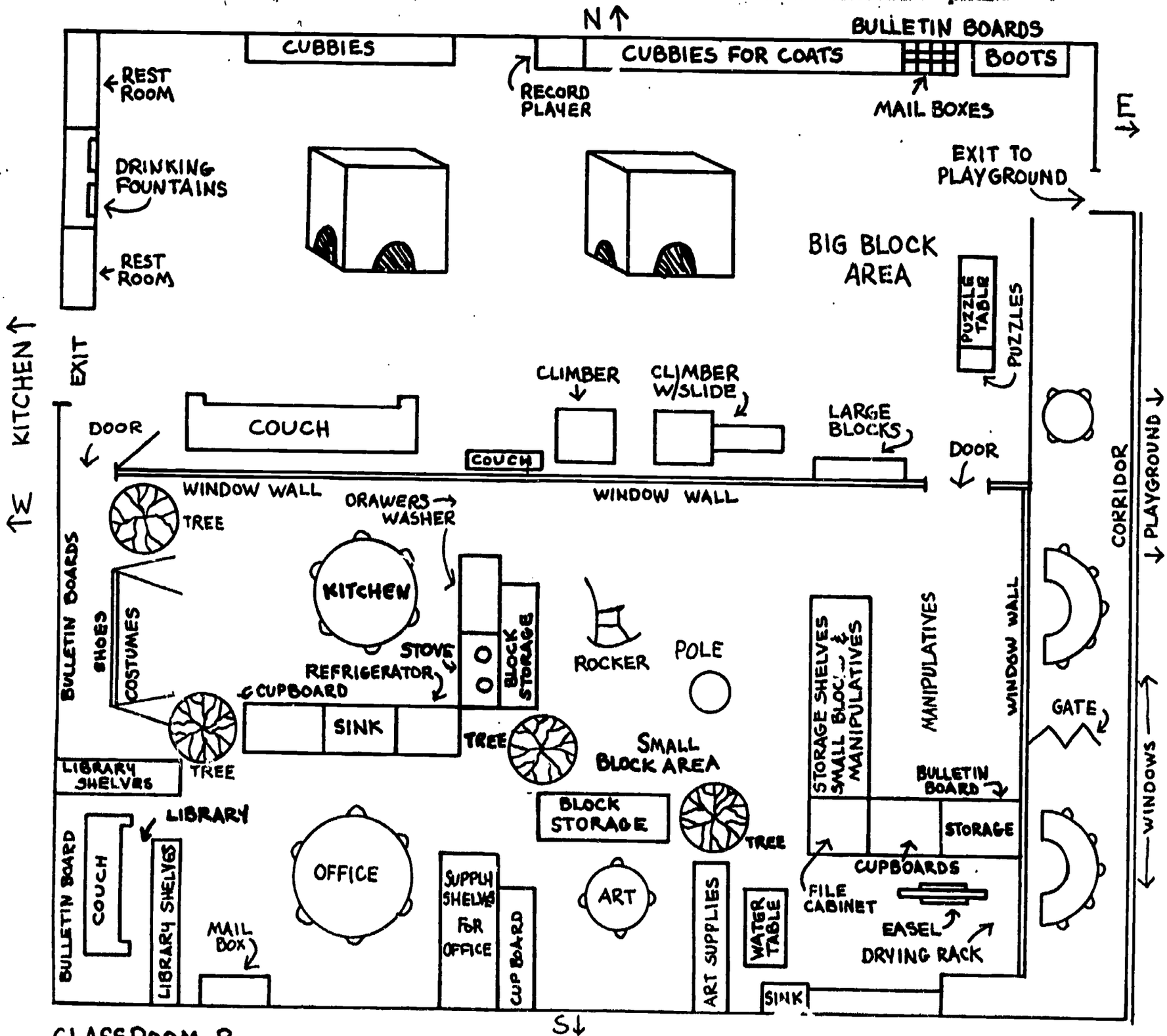
Figure 4: Complexity of literacy-related play frames: Baseline, mid-, and late intervention.

(Control)

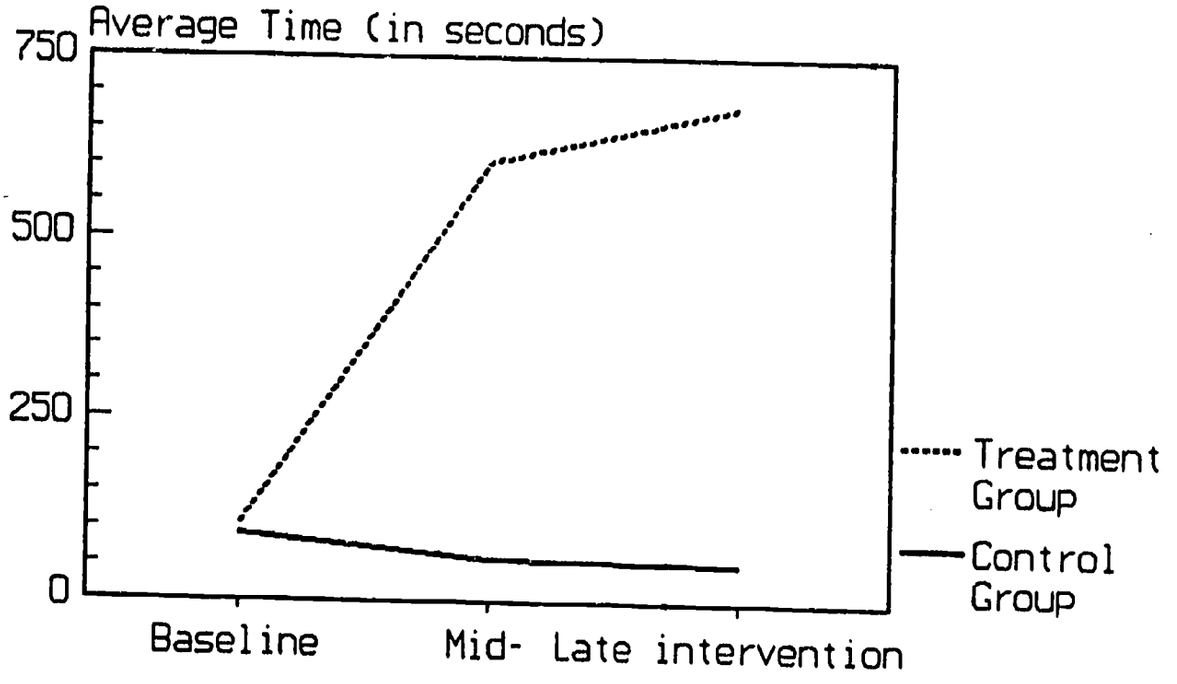

COTS
SHELVES
BLOCKS
STOVE
SINK
KITCHEN AREA
DRESS UP CLOTHES
CUPBOARDS
TABLE
AREA
SCIENCE
BLOCKS
BIG BLOCKS
BLOCK AREA
BOOK SHELF
BOOK CORNER
PET BUNNY
SMOCKS
OUTSIDE PLAY AREA
BLOCKS
CRAFT TABLE
TABLE
EASELS
ART SUPPLIES
ART AREA
CRAFT TABLE
TEACHER OFFICE AREA
PAPER TABLE
WATER TABLE

CLASSROOM B
(Experimental Site)
Prior to Literacy Enrichment





CLASSROOM B
(Following Literary Enrichment)


Average Time (in seconds)
750
500
250
0
Baseline
Mid-
Late intervention
Treatment Group
Control Group

Appendix A

Segment of a coded transcript

Code	Speaker	Statement
Sw	Elisha	Claire, I know how to write my Mom's name, wouldya like to watch me?
Rw	Claire	Yeah.
Nw Rw	Elisha	(She holds the pencil and starts to write). Want me to make an 'a?'
Rw,Nw Pw	Claire	Yeah. (She watches as Elisha begins to make a mark). I'm gonna make an 'a.'
Sw	Elisha	What's that?
Rw,Pw Ne Sw Ne	Claire	That's the 'A.' It's not very good. (She scratches furiously on her paper as Elisha looks on.) I did it wrong again, right? (She begins to scribble on her paper real hard.)
Ne	Elisha	(She begins to scribble on her paper.)
Pe,Pe Pe	Claire	Let me see. Oh yuck! We're making yucky ones.
Pe,Ne Pw	Elisha	Oh yuck! (She continues to scribble.) Now lemme make a better 'A'.