

The Impact of Environmental Print Instruction on Early Reading Ability

Patricia Kuby and Jerry Aldridge

The purpose of this research was to ascertain if there were any significant differences in the ability to read logos and to make the transition to reading logos in manuscript forms of kindergarten children who received direct instruction with environmental print, those who received indirect instruction, and those who received no instruction with environmental print. The Environmental Print Checklist (EPC) was employed to measure the children's ability to read logos and to make the transition from reading actual logos to reading logos in manuscript forms. A quasi-experimental pre-/post-test design was used with a convenience sample of six intact kindergarten classes from a large inner-city school system. The population consisted of 106 children at post-test. Those in the two treatment groups received 8 months of instruction using environmental print. After statistical analysis of the data it was found that the control and direct instruction groups were not significantly different from each other. However, the indirect instruction group scored significantly higher ($p = .01$) than both the direct instruction and the control groups at levels three, four, five, and six. The results of this study demonstrated that indirect instruction with environmental print improved kindergarten children's ability to read logos and aided them in making the transition from reading logos to reading logos in manuscript form.

Environmental print is the print found in the natural immediate environment of children, which includes logos, labels, road signs, billboards, clothing labels, coupons, newspaper advertisements, and fast food paraphernalia (Hall, 1987; Kuby, 1994; Kirkland, Aldridge & Kuby, 1991; Teberosky, 1986). Reading of environmental print is an activity children often engage in before reading print in books (Aldridge & Rust, 1987; Clay, 1991; Goodman & Altwerger, 1981; Goodman & Goodman, 1979; Hall, 1985; Wepner, 1985). Clay (1993) found that many researchers have discovered that preschool children explore the details of print in their environment, on signs, cereal packages, and

television advertisements. Children develop concepts about books, newspapers, and other print in their environment. Consequently, more advanced concepts about print emerge out of children's earlier understandings.

Goodman (1984) noted that even those children who had taken standardized tests predicting failure in reading demonstrated that they had knowledge about written language. They knew that the print in books and on other objects in the environment communicated written language messages. They understood the meaning of the sign that says "stop," even though sometimes they referred to the word as "don't go" or "brake car" before they had learned the word "stop."

Mason (1980) investigated 4-year-old children's knowledge of letters and printed words to determine if preschool children had begun reading. Some of the words used to test the children's knowledge were environmental print words. She concluded that when children are guided by parents to attend to letters, signs, and labels, and are given opportunities to read, spell, and print

Patricia Kuby, Ph.D., Associate Professor of Early Childhood/Elementary Education, Athens State University. Jerry Aldridge, Ed.D., Professor of Early Childhood Education, University of Alabama at Birmingham.

Correspondence concerning this article should be addressed to Pat Kuby, School of Education, Athens State University, 300 North Beatty Street, Athens, AL 35611.

words, they learn some of the essential elements of reading before school.

Other research on environmental print has sought to determine if young children perceive printed words as concrete ideas. Ylisto (1967) believed that children proceed through the process of learning to read in six identifiable steps: (1) seeing a photograph of a symbol in its natural setting, (2) seeing a drawing of the symbol in its natural setting, (3) seeing a drawing of the symbol in its immediate setting, (4) seeing the symbol printed in isolation, (5) seeing the symbol printed in a sentence, and (6) seeing the symbol printed in story context. She found that many young readers are able to proceed through the first three levels, but are unable to read words in levels four, five, and six, in which there are no contextual cues.

Cloer, Aldridge, and Dean (1981/82) believed that children begin to read through environmental print and that environmental print reading is developed through a sequence of stages. As with Ylisto's study, they found children do proceed through stages and have difficulty moving from the levels in which logos are in context to the levels where environmental print is de-contextualized. Similar research has been conducted by Kuby, Aldridge, and Snyder (1994), McGee, Lomax, and Head (1988), Masonheimer, Drum, and Ehri (1984). All of these studies investigated children's environmental print recognition. However, none of them looked at the effects of environmental print instruction on early reading ability.

The purpose of this study was to ascertain if the ability of kindergarten children to read logos in the environment improved and if they were able to make the transition from reading logos to reading manuscript. The two questions which guided this study were:

1. Is there a difference in the ability of kindergarten children to read logos in the environment whether they have been given direct environmental print instruction, indirect environmental print instruction, or no environmental print instruction?
2. Is there a difference in kindergarten children's ability to make the transition from the reading of actual logos to the reading of the manuscript, typed, and sentence forms of the logos whether they have been provided direct environmental print instruction, indirect environmental print instruction, or no environmental print instruction?

Method

Subjects

A quasi-experimental pretest/post-test design was used. A convenience sample of six intact kindergarten classes was chosen from a large urban school system in the Southeastern United States. The treatment and control classes were assigned to the study from existing treatment and control groups designated by the National Headstart/Public School Early Childhood Transition Demonstration Project.

The population consisted of 122 kindergarten children. The schools were randomly assigned to experimental and control groups. There were six participating intact kindergarten classes assigned to this study, chosen for their similarity in demographic characteristics. All kindergartens participating in the study had one-third to one-half of the students enrolled in a Head Start program the previous year. All students were from low-income families. The children ranged in age from 5 years, 0 months, and 26 days to 6 years, 11 months, 26 days at pretest. Five of the six teachers participating in the study had a master's degree in early childhood education and all teachers were state certified to teach children from nursery school through grade three.

Procedures

Two of the treatment group classes received direct instruction using environmental print. This was accomplished through didac-

tic, teacher-directed instruction. The other two treatment group classes received indirect instruction with environmental print through the use of center-based activities. Teachers gave directions for center use but allowed the children to choose the activities, when interested, and to work independently. The control group received no instruction with environmental print. Teachers of the control group were asked to refrain from using any environmental print instruction throughout the treatment period.

Direct instruction. Good (1979) defined direct instruction as active teaching in which a teacher sets goals and frequently makes class presentations. Specific skills are taught through recitation, repetition, and drill. For purposes of this study, direct instruction was implemented in the following manner. Children were asked to bring from home any logos they knew they could read from within a particular category (such as foods they like to eat). The teacher asked the children to look at the logo and tell her what it said. She then talked about the logo, wrote it on a flip chart in manuscript form and then wrote it in a sentence. Each child was then asked to write the logo. Teachers in the direct instruction treatment group were required to use this form of instruction, as opposed to letting the children discover for themselves.

Indirect instruction. Indirect instruction was defined as guidance which allows children to continually construct knowledge through interacting with others and the environment (Kamii, 1991). For purposes of this study, indirect instruction was defined as center-based activities for which children were asked to bring logos from home for use in a specific center. For example, in the housekeeping area, children were asked to bring coupons from home since grocery shopping materials were used. Coupons and their use were discussed. Children were given guidelines for their play but were basically allowed to construct their own knowledge about logos through imaginative play con-

cerning grocery shopping. A cash register, coupons, play money, bags, and play food items were also made available at the center. Play was conducted by the children without interference from the teacher.

The treatment period lasted from the fall of the school year to the last week in April. Prior to the study, inservice education and materials were provided for the treatment group teachers in which specific activities and ideas were presented by the researchers and a kindergarten teacher from another school system. The treatment was begun immediately after testing was completed. The first author also modeled lessons for the direct instruction group and introduced environmental print activities for learning centers to the indirect instruction group. Trade books containing environmental print were also made available to the teachers. Teachers in the control group taught, as they had previously done, according to the school system guidelines for kindergarten. Control group children received no instruction in environmental print.

The dependent variable was pretest and post-test scores on the Environmental Print Checklist (Kuby, Aldridge, & Snyder, 1994). Pretest and post-test results were compared among the three groups of children. The independent variables were direct and indirect instruction using environmental print.

Post-testing was completed in the month of May. Sixteen children were lost from the study through attrition. Ten of those children were in the indirect treatment group. At post-testing, 40 remained in the direct instruction group, 29 in the indirect instruction group, and 37 in the control group. The total number of children in the study at post-testing was 106.

Instrument

The Environmental Print Checklist (EPC) was designed by the researcher and teachers, using those logos found in the children's environment which were most

familiar to them. This instrument was refined from instruments used in two previous studies (Cloer, Aldridge, & Dean, 1981/1982; Kuby, Aldridge, & Snyder, 1994). To establish content validity, the kindergarten teachers for the four participating treatment classes submitted the logos they thought their children were most able to read. The list included McDonald's, K-Mart, Pepsi, a Stop sign, M&M's, Jello, Burger King, and Pizza Hut. From this list, the teachers, the researcher, and a consultant who taught the direct and indirect treatment teachers how to use environmental print, voted on the top five logos. There was 100% agreement between the six persons on McDonald's and K-Mart. There was 83% agreement on M&M's and Jello. The Stop sign had 65% agreement among all individuals. Inter-rater reliability for the EPC was established through the administration of the test by two Ph.D. candidates in early childhood education, with 100% agreement.

The EPC was composed of a binder containing randomly sorted copies of the five logos used in the following forms:

1. The actual color logo
2. A black and white photocopy of the actual logo (including supporting detail)
3. A black and white photocopy of the actual logo (without supporting detail)
4. The manuscript form of the logo
5. A typed copy of the logo
6. The manuscript form embedded in a simple sentence

A checksheet was used with each administration of the EPC, on which each

correct answer was scored 2, each meaning only answer was scored 1, and each incorrect answer was scored 0. An example of a meaning answer would be candy instead of M&M's or Wal-Mart rather than K-mart. A total score was derived as well as total scores for each level.

Results

To answer the first question, "Is there a difference in the ability of kindergarten children to read logos in the environment whether they have been given direct environmental print instruction, indirect environmental print instruction, or no environmental print instruction?" an analysis of covariance was used to compare results on the EPC among the three groups. After being adjusted for differences in pre-treatment, the environmental print total scores were significantly different ($F=23.191$, $df=2,102$, $p<.001$) ($N2=.15$) between the three groups. Adjusted means are shown in Table 1.

Because the groups were not equal in number, a Scheffe' multiple comparison test was applied to the adjusted means. There was no significant difference between the control and direct instruction groups. It appears that the indirect method of instruction was more effective than the direct or no instruction method in preparing the children to read the designated logos from their environment.

For the second question, "Is there a difference in kindergarten children's ability to make the transition from the reading of actual logos to the reading of the manuscript, typed, and sentence forms of the logos whether they

Table 1
Environmental Print Checklist Total Scores

Group	n	Adjusted \bar{X}	Unadjusted \bar{X}
Direct	40	34.49	35.42
Indirect	29	46.21	50.24
Control	37	33.07	28.89

have been provided direct environmental print instruction, indirect environmental print instruction, or no environmental print instruction?" a multivariate analysis of covariance was used. Two repeated-measures within-subjects factors (logo and level) and one between-subjects factor (group) was employed to determine if the kindergarten children were able to make the transition from reading actual logos to reading the logo in manuscript, the logo typed, and the logo embedded in a sentence. After adjusting for differences on the covariates, there was no significant logo by level by group interaction, logo by level, nor logo by group interactions. There was a significant level by group interaction as well as significant main effects for logo, level, and group (see Table 2).

Tests of simple main effects were utilized to investigate the level by group interaction. A review of logo set means (Table 3) revealed a similar trend across levels for each group at both pre- and post-instruction test periods,

in that the logo set means began to decrease at level two (photocopy). A comparison of the three groups at each level after adjusting for pre-instruction differences was used (see Table 4). Six comparisons were performed at the .01 level to minimize Type I error. Analysis of covariance tests indicated that the three groups were not significantly different at level one (actual logo) and level two (photocopy of logo) (Table 4). However, the three groups were significantly different at level three ($F=12.37$, $df=2,105$, $p<.001$)($N2=.091$)(photocopy without supporting detail), level four ($F=18.16$, $df=2,105$, $p<.001$)($N2=.169$)(manuscript), level five ($F=21.17$, $df=2,105$, $p<.001$)($N2=.246$)(logo typed), and level 6 ($F=15.00$, $df=2,105$, $p<.001$)($N2=.186$), (logo embedded in a sentence)(Figure 1).

A Scheffe' comparison test applied to the adjusted logo set group means at each significantly different level (three through six), revealed the control and direct instruction

Table 2
Summary of Hotellings Multivariate Tests in Repeated-Measures MANCOVA

Approximate			
Effect	F	df	p
Logo ¹	7.02	4	<.001*
Level ²	3.88	5	.003*
Group ³	8.30	16	<.001*
Interaction			
Logo x Level	1.01	20	.457
Logo x Group	1.32	8	.236
Level x Group	5.38	10	<.001*
Logo x Level x Group	1.31	40	.135

*Indicates statistical significance at $p<.001$.

¹ Logos included M&M's, Jello, McDonald's, K-Mart, and a Stop sign.

² Levels included actual logo, photocopy of actual logo, photocopy of logo with no supporting detail, the typed prompt and the manuscript prompt embedded in sentence.

³ Groups included direct instruction, indirect instruction, and control.

Table 3
Means for Logos by Levels

Level*	Direct		Indirect		Control	
	Pre	Post	Pre	Post	Pre	Post
1	8.65	9.13	8.86	9.76	6.95	8.00
2	8.40	9.08	8.90	9.62	7.00	7.70
3	6.50	7.60	7.03	9.21	4.46	5.97
4	2.60	4.15	4.17	8.21	1.59	3.19
5	2.10	3.25	4.24	7.48	1.38	2.89
6	0.72	2.08	1.72	5.69	0.43	1.24

*Levels were as follows: 1 = actual logo; 2 = photocopy of actual logo; 3 = photocopy of logo with no supporting detail; 4 = manuscript prompt; 5 = typed prompt; 6 = manuscript prompt embedded in a sentence.

Table 4
Group Logo Means by Level

Group	Level*					
	1	2	3	4	5	6
Direct	8.846	8.895	7.302	4.195	3.313	2.174
Indirect	9.376	9.195	8.622	7.365	7.123	5.214
Control	8.606	8.235	6.752	3.805	3.103	1.504

*Levels were as follows: 1 = actual logo; 2 = photocopy of actual logo; 3 = photocopy of logo with no supporting detail; 4 = manuscript prompt; 5 = typed prompt; 6 = manuscript prompt embedded in a sentence.

groups were not significantly different from each other. However, the indirect instruction group scored significantly higher than both the direct instruction group and the control group at level three (photocopy with no supporting detail), level four (manuscript), level five (typed), and level six (sentence) at the .01 level.

Conclusions and Implications

Indirect instruction using environmental print appears to have a positive influence on the ability of kindergarten children to read logos from their environment as compared

to those who receive direct instruction in environmental print or no environmental print instruction. Thus, using an indirect constructivist approach to environmental print instruction did lead to word reading of logos from the children's environment. Based on this research, environmental print activities used in the kindergarten classroom should be center-based, giving children instructions about materials, but allowing them to construct their own knowledge from the inside as they interact with the environment (Kamii, 1993). This research supports the use of literacy play centers, as described by

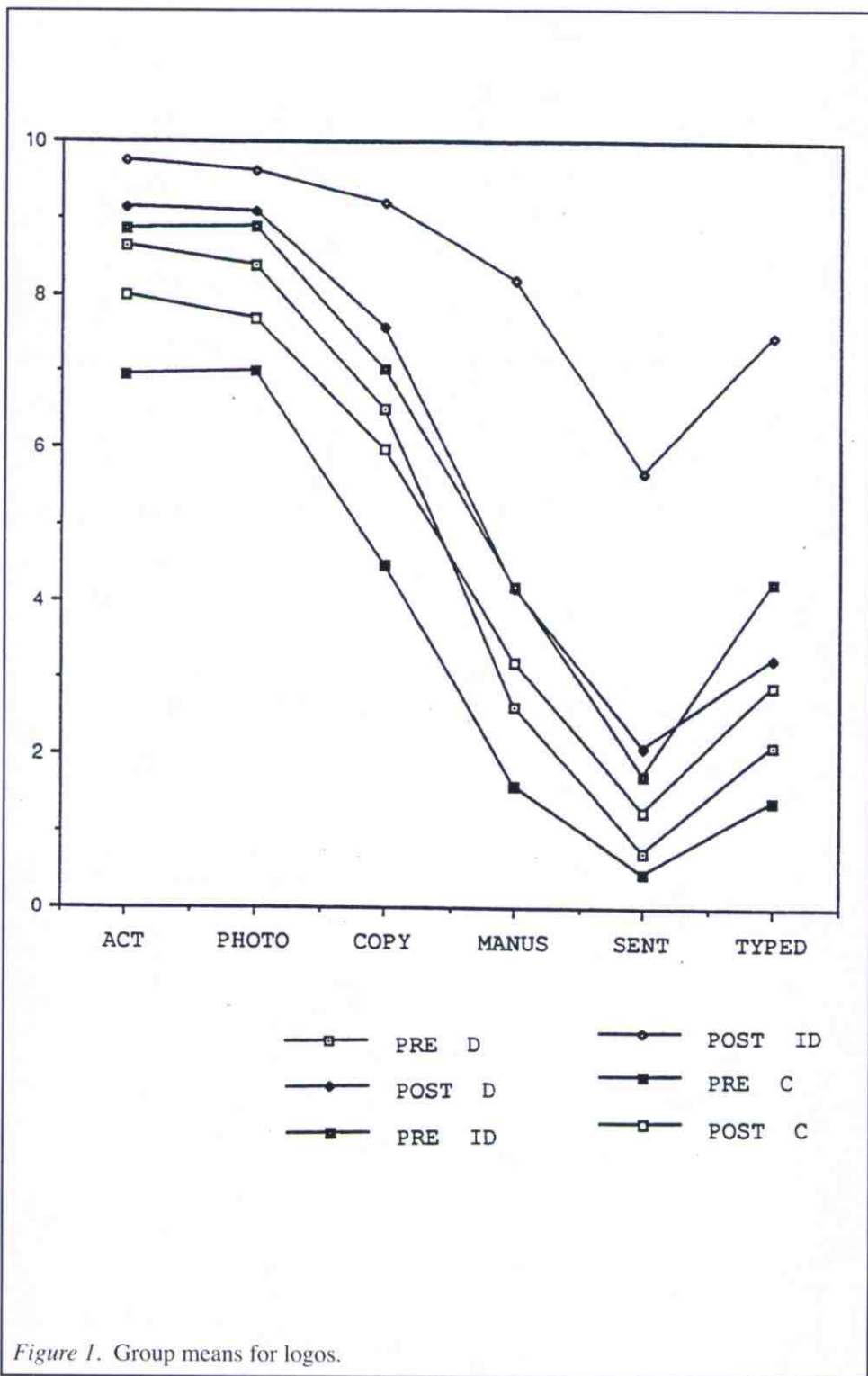


Figure 1. Group means for logors.

Campbell and Foster (1993) and Rybczynski and Troy (1995).

The use of indirect instruction with environmental print capitalizes on the fact that young children are reading print from the environment when they come to school. Using environmental print activities in center-based instruction makes reading and writing in school natural and enjoyable for children (Aldridge, Kirkland, & Kuby, 1996). Children who see and use high interest words in context learn many of the purposes of literacy (Manning, Manning, Long, & Wolfson, 1987).

Ironically, results from this study indicated that direct instruction using environmental print is of less value than center-based learning. In fact, in this study, direct instruction was of no more value than no instruction (in environmental print) at all. Since we found no other research on environmental print instruction, clearly more research is needed on how children best learn from their natural environment. Further, the impact of parental involvement in environmental print should also be investigated.

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