

**Reducing Social Inequality in Elementary School  
Reading Achievement:**

**Establishing Summer Literacy Day Camps for  
Disadvantaged Children**

by

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## Abstract

During summer vacation, children who attend high-poverty schools experience decreases in reading achievement, while children from low-poverty schools experience improvement (Alexander, Entwistle & Olsen, 1997; David & Pelavin, 1978; Heyns, 1987; Murnane, 1975). The purpose of this study was to turn disadvantaged children's summer reading losses into gains by sending them to an eight-week summer literacy day camp. Explicit systematic reading instruction was blended into a summer day camp context that included swimming, crafts, arcade, magic, drama, field trips and other camp activities. The results of this study present initial evidence to advocate that elementary schools and parks and recreation centers form partnerships to educate disadvantaged students year round. The effect sizes for children who attended the literacy camp compared to those who did not were: vocabulary ( $d = 1.00$ ), comprehension ( $d = 1.09$ ), phonics skills ( $d = 1.2$ ), and oral reading ( $d = 0.88$ ). Control students who did not attend the literacy camp experienced significant decreases in reading achievement on vocabulary and phonics skills assessments.

## Introduction

Less than ten percent of children fail to learn to read because of a reading disability (Foorman, Fletcher & Francis, 1998; Torgeson, Wagner & Roshotte, 1997; Vellutino, Scanlon, Sipay & Denckla, 1996), yet seven out of ten disadvantaged children fail to read at the most basic level (U.S., Department of Education, 1999). When disadvantaged children enter school, their

reading scores on standardized assessments are significantly lower than middle and low-poverty children. As they progress through school, the reading achievement gap widens each year (Alexander et al., 1997). By the time disadvantaged students exit fourth grade, only one of ten read at the Proficient level on the National Assessment of Educational Progress (U.S. Department of Education, 1999). New ideas are needed to ensure that social inequality does not perpetuate illiteracy.

The idea for this study was based on a recent finding published by the authors of the *Beginning Schools Study*, a longitudinal study of 20 randomly selected high-poverty (over 75 percent of students on free and reduced-price lunch) and low-poverty (under 25 percent of students on free and reduced-price lunch) elementary schools. Researchers Alexander, et al. (1997), determined that children who attend high- and low-poverty schools make similar reading achievement gains when school is in session (even though they start at different initial achievement levels). However, during summer vacation, children who attend high-poverty schools experience decreases in reading achievement, while children from low-poverty schools improve. According to these researchers, the cumulative summer losses of disadvantaged K-5 readers accompanied by the cumulative gains of middle- and high-income K-5 students account for a large portion of the differences in reading achievement by the time students exit elementary school (Alexander et al., 1997). The purpose of this study was to turn disadvantaged children's summer reading losses into gains. To do this, a summer literacy day camp that served disadvantaged first grade students was developed.

## **Why Reading Achievement of Disadvantaged Children Is Lower than That of Middle- and High-Income Students**

Poor reading achievement among disadvantaged children is due to family circumstances, the quality of the neighborhoods in which they live, and the quality of the schools they attend (National Research Council, 1998).

### ***Children from High-Poverty Families***

Children from high-poverty families come to school being read to at home less than middle- and high-income children (U.S. Department of Education, 1996). They come from households with a scarcity of books, magazines, newspapers, and other print materials (Needlman, Fried, Morley, Taylor, & Zuckerman, 1991; Dickinson, 1991). And, their families watch more television and read less for pleasure than middle and high-income families (Hofferth, 1998). Regular home reading, access to literacy rich environments, verbal interactions around books, and positive attitudes and values placed on literacy are all related to future reading success (National Research Council, 1998). Because high-poverty families provide fewer opportunities for their children to develop these essential reading readiness skills, it is not surprising that research has demonstrated that children lacking these reading readiness skills will have a harder time learning to read (Hammill & McNutt, 1980; Scarborough, 1998).

Poverty and one's level of education are highly related. Research that demonstrates that disadvantaged children have parents who are less

educated than middle- and high-income parents is not news (Dawson, 1991; U.S. Bureau of Census, 1992). What is news is that the more education a mother has, the more likely she is to read to her child. And the less education a mother has, the less likely she is to implement optimal literacy techniques (U.S. Department of Education, 1997). Uneducated mothers are less likely to question their children about what they read, and they allow their children to select books that do not challenge and advance their reading skills (U.S. Department of Education, 1997; U.S. Department of Education, 1998). Moreover, uneducated mothers are more likely to be parents who never married (Moore & Puma, 1995). Children from never-married households are more likely to be retained, receive lower grades, obtain lower scores on standardized tests, and are more often absent and late than children of divorced parents or two parent households (Alexander et al., 1997). Mothers who never married are also the least likely parents to monitor their children's schoolwork and to supervise them at home (Astone & McLanahan, 1989; 1991; Dornbusch et al., 1985). These characteristics led Educational Testing Service researchers (ETS, 1995) to conclude that a mother's literacy level was the most significant predictor of a child's literacy level.

Along with lower levels of education, disadvantage children's parents have lower expectations for their child's reading achievement and future job prospects than middle- and high-income parents (Alexander et al., 1997). Parental expectations are important because expectations influence the actions parents take. The lower expectations of parents of disadvantaged children lead to less frequent school visits, less monitoring

of their child's academic work, and fewer visits and books checked out from the school library compared to middle- and high-income children. Entwistle and Hayduk (1988) found that parents' forecasts of their children's ability to do schoolwork in the primary grades had a large and significant effect on the children's California Achievement Test and Iowa Test of Basic Skills scores three years later. Sundius (1996) determined that parents' expectations at the beginning of fourth grade are more powerful predictors of grades later that year than are the child's California Achievement Test scores or family economic status. Stevenson and Newman (1986) showed that tenth graders' self-concept and academic attitude were predicted by their mothers' ratings of their ability in fifth grade and earlier. Finally, in the *Beginning School Study*, parental expectations were one of the strongest predictors of a child's reading achievement.

Disadvantaged children enter school behind in reading readiness skills, come from families with lower levels of education and expectations for their reading achievement, and are more likely to have parents who never married, with fewer financial resources, more demands on their time, and fewer of the academic and personal resources to help them succeed (Coleman, 1988).

### ***Children from High Poverty Neighborhoods***

Like family influences, the neighborhoods in which children live are also associated with reading achievement (Alexander et al., 1997; National Research Council, 1998; U.S. Department of Education, 1999). In the *Beginning School Study*, the reading test scores of

beginning first graders from low-poverty schools were 302 on the California Achievement Test compared to 265 for beginning first graders from high-poverty schools, a difference of 37 scale score points. By the end of fifth grade the difference in reading achievement was 66 points (Alexander et al., 1997). Because the *Beginning School Study* tested students in fall and spring of each year, the researchers were able to show that the achievement gains were due almost entirely to the combination of disadvantaged students' summer losses and advantaged students' summer gains. These researchers concluded that only when schools were not in session did children who resided in better off neighborhoods make greater achievement gains than those who lived in depressed communities.

To account for why some of these differences may have occurred, Alexander et al. (1997) reported that during the summer children from low-poverty schools went on more trips, went to the library more often, and played more organized sports than children from high-poverty schools. Moreover, parents of low-poverty school children viewed themselves as partners in the learning process when school was out of session and claimed that it was their responsibility to find summer resources and programs within their neighborhoods to support their children's learning (Alexander et al., 1997).

### ***Children from High-Poverty Schools***

It is well known that neighborhoods differ in terms of the socioeconomic status of the families that inhabit them, and elementary schools unfortunately follow suit. The *Coleman Report* (1966) demonstrated that elementary schools are stratified along the lines of neighborhood and family

socioeconomic status. More recent data from the *Beginning Schools Study* found high correlations between meal subsidy level (school poverty indicator), median household income  $r = .86$ , and family poverty level  $r = .83$ . What these data demonstrate is that elementary schools are tracked based on socioeconomic characteristics. This is problematic for several reasons. High-poverty schools are (a) more likely to have fewer qualified teachers, (b) rely more on unqualified teacher aides for instruction, (c) employ teachers who have lower expectations for student achievement, (d) retain more children, and (e) have less parental involvement than low-poverty schools

***Fewer Qualified Teachers.*** The proportion of newly hired teachers in high-poverty school districts that lacked certification was at least twice that of newly hired teachers in low-poverty districts (U.S. Department of Education, 1999). The proportion of newly hired teachers with emergency credentials in high-poverty districts was greater than in middle and low poverty districts. In predominantly white districts, 94 percent of newly hired teachers were fully certified compared with 75 percent in districts where minorities constituted one-half or more of the student population (U.S. Department of Education, 1999). These data are alarming because one of the few, if only, correlates between teacher characteristics and student achievement is whether the teacher is fully certified (Darling-Hammond, 1998; Haberman, 1985; Evertson, Hardy, & Zlotnik, 1985; Schacter in press).

***Unqualified Teacher Aides.*** High-poverty schools rely more on teacher aides for instruction than low-poverty schools (U.S. Department of Education, 1999). The overwhelming majority of teacher aides do not have a college degree or

any certification to teach. Only 10 percent of Title I aides in the highest-poverty schools have a bachelor's degree. Yet 88 percent of these aides taught or helped teach reading with no training or teaching credentials. Paraprofessionals are used in many Title 1 schools for teaching even though their educational backgrounds do not prepare them for such responsibilities (U.S. Department of Education, 1999).

***Teacher Expectations.*** Teachers have different expectations for students in high- and low-poverty schools. First-grade teachers in low-poverty schools expected their pupils in the next school year to earn more A's and B's than C's and lower, yet teachers in high-poverty schools expected all their children to earn C's or below (Alexander et al., 1997). Teacher expectations are also evident through grade inflation. When measured against a common test, an "A" student in a high-poverty school would be a "C" student in a low-poverty school (U.S. Department of Education, 1997).

***Retention.*** A far greater percentage of children are retained in high-poverty than low-poverty schools (Alexander et al., 1997). Children in the *Beginning School Study* who were retained were absent 50 percent more often, less popular with peers, less involved in classroom activities, and less well behaved than students who were not retained. Further, the link between retention and dropping out is strong (Cairns, Cairns & Weckerman, 1989; Lloyd, 1978). One national study shows a dropout rate of about 40 percent among those who were retained in first grade compared to 10 percent among those that were never held back (Bachman, Green, & Wirtanen, 1971; See also Tuck, 1989; Fine, 1991). Royce, Darlington & Murray (1983) report that com-

pared with similar students who were not retained, retained students were more likely to be unemployed, to be living on public assistance, or to be in prison.

***Lack of parental involvement.*** In high-poverty schools there is a lack of parental involvement. Interview data from a longitudinal study of 71 high-poverty schools showed that over half of the fourth grade teachers said that "few or none" of their low achieving students had parents who were at least moderately involved (Turnbull & Zucker, 1993). Principals in high-poverty elementary schools reported that only 33 percent of parents attended most or all school events compared to 77 percent of parents in low-poverty schools (U.S. Department of Education, 1998; U.S. Department of Education, 1997).

### ***Conclusion***

Children from high-poverty schools suffer significant and cumulative reading losses over the summer. These summer reading losses – as measured by the California Achievement Test – are most pronounced in children entering first and second grade (Alexander et al., 1997). What accounts for these differences are depressed families, neighborhoods and schools. According to Alexander et al., (1997) the optimum time for reading intervention is the summer after or before first grade, because reading achievement occurs twice as fast in first grade compared to third grade.

A long standing idea schools have implemented to remediate reading achievement for low performing students has been to send those students to summer school. Few to no summer schools, however, are targeted toward exiting first grade students even though learning is

accelerated during this age. Furthermore, a review of the research on the effect of summer schooling for disadvantage youth demonstrated that summer school adds little to nothing to student reading achievement scores (Heyns, 1987). Heyns (1987) concluded, "summer school has not been effective in reducing differences in disadvantaged children's achievement (p. 159)."

One reason why summer school may have little to no effect on reading achievement is that it is offered too late in the child's academic career, usually at the end of third grade. A second reason is that summer school programs are viewed as punitive. Children know that they are in summer school because they cannot read well. These children also know that they are missing out on the freedom and fun associated with summer. A third possible reason why summer school has failed to achieve reading gains in disadvantaged students is that summer schools do not afford children a different set of experiences to learn from than those provided during the regular school year (Alexander et al., 1997).

This study addressed each of the above issues: (a) disadvantaged first-grade students were the target population for the reading intervention because at this age they have the optimum chance to improve; (b) the program was not punitive – it was part of a summer camp; (c) reading instruction was blended with a summer day camp to provide a different set of experiences from school (e.g. swimming, dance, drama, crafts, music, arcade, field trips, and other summer camp activities); and (d) systematic, explicit daily phonics instruction served as the curriculum as three major recent reviews of research have advocated the benefits of this approach (National Reading Panel, 2000; National Research Council, 1998;

Adams & Engelmann, 1996).

## Hypotheses Tested

Three hypotheses were tested.

1. Disadvantaged first-grade students from schools whose reading scores were below the 25th percentile who attended an eight week summer literacy camp will perform better on all assessments of reading achievement than students who did not attend the camp.
2. Disadvantaged first-grade students from schools whose reading scores were below the 25th percentile who attended the summer literacy camp will improve on all measures of reading achievement taken at the beginning and the end of the intervention.
3. Disadvantaged first-grade students from schools whose reading scores were below the 25th percentile who did not attend the summer literacy camp will experience a decrease in reading achievement from the beginning to the end of the summer.

## Method

This intervention assessed the effect that attending a summer literacy day camp had on disadvantaged exiting first-grade students' reading achievement. The intervention was eight weeks with 32 days of reading instruction for two hours each day. Eight days were allocated for testing and field trips. Control group participants were drawn from four first grade classrooms from two elementary schools within a one-mile radius of the summer camp. Intervention students' parents enrolled them in the summer liter-

acy camp at a subsidized cost. Intervention students attended one of three neighborhood schools within a one-mile radius of the summer camp. Four dependent variables measured individual student reading achievement.

## *Participants*

Participants included sixty-one exiting first grade students from three schools in the Los Angeles area with at least 75 percent of children on free and reduced lunch. The first-grade reading scores on state mandated standardized tests for each of the schools were all below the 25th percentile. The sample consisted of 35 boys and 26 girls. Ten students were dropped because they moved over the summer, or did not attend the school the following fall, thus post-test scores were not available. The final sample consisted of 31 boys and 20 girls identified by the schools as 37 African-American and 14 Latino/a. The control group consisted of thirty students: 18 boys and 12 girls, 18 African-Americans and 12 Latino/a. The intervention cohort consisted of 21 students: 13 boys and 8 girls, 19 African-Americans and 2 Latino/a.

*Sampling.* Four first-grade classrooms were randomly selected from two elementary schools within a one-mile radius of the camp to serve as the control group. Ten students were randomly selected from each classroom for a total of 40 students, 20 boys and 20 girls. Because of student mobility, ten students from the control group were not available for post-testing. These students were dropped from the study. Twenty-one students were enrolled in the intervention by their parents at a subsidized cost.

### ***Intervention***

Over the course of the eight-week intervention, children participated in two hours of reading instruction per day. The remainder of the day was dedicated to summer camp activities such as swimming, arts and crafts, music, drama, sports, dance, arcade, and various theme week activities. Students were pre-tested on a battery of reading measures during the first week of camp and post-tested on the same measures during the last week of camp. Control students were pre-tested at the end of the academic year, the week of June 12, and post-tested on the same battery of assessments at the beginning of the next academic year, the week of September 11.

Each day, a credentialed elementary school teacher taught reading. Three camp counselors assisted the reading teacher. Open Court Reading series for first grade served as the curriculum. Open Court was supplemented one to two days a week by a basal reading series for extended practice in oral reading and comprehension skills. Further, students were read to for 10 minutes every day before formal instruction began, and engaged in journal writing every day at the close of instruction.

A volunteer tutored every student for at least one hour per week. The majority of students were tutored two hours per week. Volunteer tutors were trained in the Howard Street Tutoring Manual (1999), which consisted of reading easy text, word attack games and decoding skills, writing, and reading more difficult text. Word attack games and decoding skills were designed by the researcher and based on activities from *Words Their Way* (1996). Books for tutors were purchased and leveled based on Su Pinnel et al. (1999) leveling system.

Computer software was also used to supplement instruction. Software use however, was not a consistent or integrated part of instruction. Three software applications were purchased. One focused strictly on phonemic awareness, the other two placed a heavy emphasis on phonics.

Finally, students were grouped by ability for instruction based on pretest scores to determine where in the Open Court curriculum instruction for each group would begin.

### **Dependent Measures**

***Gates-MacGinitie Vocabulary/Word Decoding Level 1 Fourth Edition.*** This 43 item sub-test of the Gates-MacGinitie designed for students at the middle and end of first grade requires students to identify from among words that look alike, the one word that fits the picture. Students were given twenty minutes to complete the test.

***Gates-MacGinitie Comprehension Level 1 Fourth Edition.*** This 39 item sub-test of the Gates-MacGinitie designed for students at the middle and end of first grade requires students to read stories and non-fiction passages each divided into short segments. The student's task is to choose the picture that illustrates a segment or that answers a question about it. Students were given 35 minutes to complete the test.

***CORE Phonics Survey.*** The CORE Phonics Survey assesses the phonics and phonics-related skills that have a high rate of application in beginning reading. The assessment presents a list of words for the student to identify or decode. Pseudo words are included since the student must use decoding skills to correctly pronounce these words and cannot have memorized them. Seven sub-tests for decoding were used. They included:

Short vowels in CVC words (real and pseudo words), short vowels, digraphs, and -tch trigraph (real and pseudo words), short vowels and consonant blends (real and pseudo words), long vowels (real and pseudo words), vowel diphthongs (real and pseudo words), R and I controlled vowels (real and pseudo words), and multi-syllabic words (real and pseudo words). Four spelling skills sub-tests were used: Initial consonants, final consonants, CVC words, and long vowel words.

***Fry Oral Reading Survey.*** The Fry Oral Reading Survey assesses the rate and accuracy with which a student reads text aloud. The test consists of a series of short, graded passages with readability levels from early first grade to the end of seventh grade.

### ***Procedures***

Both teacher and camp counselor training procedures were conducted. Scoring procedures for the dependent measures are described at the end of this section.

***Teacher training.*** The reading teacher in this study participated in a two-day training session in implementing the Open Court curriculum and instructional techniques offered through a large school district in Los Angeles. After the training, the teacher and researcher in this study spent several weeks reviewing all materials and planning for the scope and sequence of instruction. Teacher training was conducted to ensure that the Open Court curriculum was being implemented as designed, and to ideally reduce individual teacher effects on student performance.

***Counselor training.*** All three camp counselors participated in three days of training prior to the beginning of camp. Counselors attended a

full day of training sponsored by the American Camping Association. Counselors also participated in two days of training at the campsite where team building, theme week and games, pool safety, and reading instructional training and activities took place.

***Test Administration.*** The author of the study administered and scored all individual and class tests for the intervention and control groups. Test administration scripts for each measure were strictly followed.

***Scoring: Reading Vocabulary.*** The vocabulary portion of the test consisted of 43 multiple-choice items where students selected from four word choices the word that best identified the picture. A raw score of 43 was the highest score a student could attain. One point was awarded for each correct answer.

***Scoring: Reading Comprehension.*** The comprehension portion of the test consisted of 39 multiple-choice items where students read short passages then identified the picture that the passage described. Three pictures for each passage were presented. A raw score of 39 was the highest score a student could receive if he or she answered all questions correctly. One point was awarded for each correct answer.

***Scoring: CORE Phonics Survey.*** The CORE Phonics Survey was an individually administered test consisting of 114 items in 11 sub-scales. One point was awarded for each correctly answered item. Scores from all sub-scales were summed to produce a single score. A total of 114 points were possible if the student read all items correctly.

***Scoring: Fry Oral Reading.*** Students were instructed to read each passage at their regular reading rate. The researcher asked each student to continue reading the next passage until he or

she reached frustration levels (reading less than 40 words per minute and five or more reading errors per passage). Inserted words, deleted words, and words students read incorrectly were counted as errors. Reading rate was calculated by dividing the total number of words in the passage by the time it took students to complete the passage. Students who read passages successfully had a reading rate of above 40 words per minute and less than four errors per passage.

## Results

Presented in this section are: (a) descriptive statistics for pre-test and post-test vocabulary, comprehension, phonics, and oral reading scores; (b) a correlation matrix of all dependent variables collected in this study; (c) significance tests that analyzed initial student reading performance of intervention and control students; and (d) hypotheses tests.

### *Descriptive Statistics*

Descriptive statistics for pre-test and post-test vocabulary, comprehension, phonics, and oral reading scores are reported in Table 1.

**Table 1.**  
**Means and Standard Deviations for Dependent Measures by Condition**

Measures	Intervention Students <sup>a</sup>	Control Students <sup>b</sup>
Vocabulary		
M	16.1 (24.2)	24.1 (21.9)
SD	9.5 (8.7)	9.0 (9.2)
Comprehension		
M	13.5 (21.4)	18.6 (17.5)
SD	9.2 (9.4)	7.4 (7.5)
Phonics		
M	39.3 (63.5)	66.8 (54.5)
SD	25.9 (27.0)	27.3 (25.5)
Oral Reading		
M	2.3 (3.8)	3.2 (3.2)
SD	2.3 (2.6)	2.5 (2.2)

<sup>a</sup>*n* = 21

<sup>b</sup>*n* = 30

*Note.* Parentheses indicate post-test scores.

Table 2 presents a correlation matrix of the dependent variables employed in this study. All variables were analyzed as continuously scaled after inspection of the frequency distributions revealed relatively little skewness or kurtosis.

**Table 2.**  
**Correlational Matrix of Dependent Variables**

	1	2	3	4	5	6	7	8
<u>Pearson Correlation</u>								
1. Pre-test Vocabulary	1.00							
2. Post-test Vocabulary	.731	1.00						
3. Pre-test Comprehension	.818	.592	1.00					
4. Post-test Comprehension	.652	.838	.628	1.00				
5. Pre-test Phonics	.878	.663	.706	.545	1.00			
6. Post-test Phonics	.683	.878	.540	.788	.747	1.00		
7. Pre-test Oral Reading	.867	.786	.717	.718	.857	.826	1.00	
8. Post-test Oral Reading	.720	.852	.613	.826	.738	.911	.877	1.00

### ***Initial Student Reading Performance***

Pretests for vocabulary, comprehension, phonics, and oral reading were employed to assess students' initial reading abilities before the intervention. Three multivariate analysis of variance (MANOVA) models were run to demonstrate that there were no initial differences in reading achievement due to race, sex, or condition.

The first model used the pretests for vocabulary, comprehension, phonics, and oral reading as the dependent variables and sex as the independent between-subjects variable. No significant differences in initial reading achievement were found for either multi- or univariate tests due to the sex of the student. The multivariate Hotelling's  $F(4, 46) = .634, p = .64$ ; and univariate results for vocabulary  $F(1, 49) = .017, p = .90$ ; comprehension  $F(1, 49) = .094, p = .76$ ; phonics  $F(1, 49) = .65, p = .42$ ; and oral reading level  $F(1, 49) = .43, p = .51$  were all not significant.

The second model used the pretests for vocabulary, comprehension, phonics, and oral

reading as the dependent variables and race as the independent between-subjects variable. No significant differences in initial reading achievement were found for either multi- or univariate tests due to the race of the student. The multivariate Hotelling's  $F(4, 46) = 2.26, p = .08$ ; and univariate results for vocabulary  $F(1, 49) = .37, p = .55$ ; comprehension  $F(1, 49) = .59, p = .45$ ; phonics  $F(1, 49) = .86, p = .36$ ; and oral reading level  $F(1, 49) = .005, p = .95$  were all not significant.

The third model used the pretests for vocabulary, comprehension, phonics, and oral reading as the dependent variables and condition (intervention versus control) as the independent between-subjects variable. The multivariate Hotelling's  $F(4, 46) = 8.96, p = .000$ ; and univariate results for vocabulary  $F(1, 49) = 9.17, p = .004$ ; comprehension  $F(1, 49) = 4.66, p = .036$ ; and phonics  $F(1, 49) = 13.09, p = .001$  were all significant with oral reading  $F(1, 49) = 8.58, p = .025$  being the only variable where differences were not found. Students' initial reading achievement in the control group was significantly greater than students' initial reading achievement in the intervention.

### ***Conclusions***

These analyses showed that no multivariate or univariate differences in reading achievement were found due to the students' sex or race. However, both multivariate and univariate differences were found due to condition (intervention or control). Because student's parents enrolled them in the intervention at a subsidized cost, they were not randomly selected and assigned. All students from both the intervention and control group came from schools reading at or below the

25th percentile on the SAT 9 reading assessment, yet control students' initial performance was significantly greater across the battery of measures than the intervention students. Differences in final reading achievement between the intervention and control group were therefore tested by using the pretest battery as covariates to adjust for student's entry level reading achievement.

## Hypotheses Tests

**Hypothesis 1.** Disadvantaged first-grade students from schools whose reading scores were below the 25th percentile who attended an eight week summer literacy camp will perform better on all assessments of reading achievement than students who did not attend the camp.

Multivariate analysis of covariance (MANCOVA) was used to adjust for the effects of initial reading achievement differences between intervention and control groups. A one (dependent measures) by two (group) MANCOVA with the pretests for vocabulary, comprehension, phonics, and oral reading serving as covariates was run. As predicted, a main effect difference by group (intervention versus control) was significant for the multivariate analysis Hotelling's  $F(4, 42) = 25.15, p = .000$ . Further, all univariate analyses were significant by group; vocabulary  $F(1, 45) = 28.22, p = .000$ ; comprehension  $F(1, 45) = 27.18, p = .000$ ; phonics  $F(1, 45) = 93.25, p = .000$ ; and oral reading  $F(1, 45) = 41.8, p = .000$ . An interpretation of the means revealed that on the vocabulary, comprehension, phonics, and oral reading measures, students that participated in the summer literacy camp significantly outperformed students in the control condition (Table 3).

**Table 3.**

**Adjusted Means Intervention and Control**

	Intervention	Control
Measures		
Vocabulary		
M	28.18*	19.14
SE	1.18	.94
Comprehension		
M	24.43*	15.36
SE	1.2	.96
Phonics		
M	76.67*	45.24
SE	2.3	1.8
Oral Reading		
M	4.68*	2.59
SE	.22	.18

*Note.* Multivariate Hotelling's  $F(4, 42) = 25.15, p = .000$ . Covariate Hotelling's vocabulary  $F(4, 42) = 2.96, p = .031$ . Covariate Hotelling's comprehension  $F(4, 42) = 1.51, p = .22$ . Covariate Hotelling's phonics  $F(4, 42) = 14.9, p = .000$ . Covariate Hotelling's oral reading  $F(4, 42) = 4.3, p = .005$ .

\* *Note.* Indicates significance at the  $p = .000$  level.

**Hypothesis 2.** Disadvantaged first-grade students from schools whose reading scores were below the 25th percentile who attended the summer literacy camp will improve on all measures of reading achievement from the beginning to the end of the intervention.

Paired sample t tests were run to test whether students in the intervention and control group improved in their reading achievement over the

summer. Across all reading achievement measures intervention students significantly improved from pre- to post-tests at the  $p = .000$  level (Table 4).

**Table 4.**  
**Paired Sample t Tests Intervention**

Measure	<i>n</i>	Pre-Post Mean Difference	<i>t</i> value	<i>df</i>	<i>p</i> level
Vocabulary Pre-test-Post-test	21	8.1	6.5	20	.000
Comprehension Pre-test-Post-test	21	7.9	5.5	20	.000
Phonics Pre-test-Post-test	21	24.2	10.8	20	.000
Oral Reading Pre-test-Post-test	21	1.5	8.3	20	.000

**Hypothesis 3.** Disadvantaged first-grade students from schools whose reading scores were below the 25th percentile who did not attend the summer literacy camp will experience a decrease in reading achievement from the beginning to the end of the summer.

Across all measures the control group did not improve. Students in the control group scored significantly lower from pre-tests to post-tests in reading vocabulary/decoding and phonics (Table 5).

**Table 5.**  
**Paired Sample t Tests Control**

Measure	<i>n</i>	Pre-Post Mean Difference	<i>t</i> value	<i>df</i>	<i>p</i> level
Vocabulary Pre-test-Post-test	30	-2.2	2.9	29	.007
Comprehension Pre-test-Post-test	30	-1.1	1.1	29	.29
Phonics Pre-test-Post-test	30	-12.4	8.6	29	.000
Oral Reading Pre-test-Post-test	30	-.033	.18	29	.86

### **Conclusion**

The results reported here found that when reading instruction and tutoring were integrated into a summer day camp context, disadvantaged first-grade children from schools whose reading test scores were below the 25th percentile made significant reading gains compared to students who did not attend the summer intervention. The effect sizes for vocabulary ( $d = 1.00$ ), comprehension ( $d = 1.09$ ), phonics skills ( $d = 1.2$ ), and oral reading ( $d = 0.88$ ) clearly illustrate the magnitude of the literacy camp program success. As predicted, the summer literacy campers' reading achievement scores went up substantially across all measures of reading achievement while the control group students' reading achievement scores went down or remained the same. Control group students performed significantly worse from the end of first grade to the beginning of second grade on the vocabulary  $t(1, 29) = 2.9$ ,  $p = .007$ , and phonic skills  $t(1, 29) = 8.6$ ,  $p = .000$  assessments.

These results provide initial evidence to support the idea to establish summer literacy camps as an effective way to both reduce the long stand-

ing problem of disadvantaged students reading achievement summer slide (David & Pelavin, 1978; Heyns, 1987; Murnane, 1975), and also to reduce the reading achievement divide between children from high- and low-poverty schools.

By integrating daily reading instruction within the context of a day camp that included swimming, drama, arts and crafts, magic, music, dance, field trips and other camp activities, the set of experiences provided to children were vastly different from school. A summer camp context set the precedence that children were not enrolled in the program for punitive reasons, but to have the freedom and fun summer provides while continuing to learn how to read. Further, by intervening in first grade when children's reading achievement occurs twice as fast compared to third grade (Alexander et al., 1997), the summer literacy camp optimized disadvantaged children's chances for reading success.

If disadvantaged students progress at faster reading rates in first grade, and if a major cause of reading degeneration is a lack of summer and/or off track reading, one wonders why so little preventative and intervention research has focused on this problem. In light of the results of this study, one should question why so few Title I resources have been spent on summer enrichment reading programs. The Promising Results, Continuing Challenges report (1999) states that less than half of Title I schools are using Title I funds to implement extended learning time programs. Even though this is up from nine percent before reauthorization, these programs are only serving 11 percent of the students.

This research suggests that one solution to stopping the reading slide is to have young disadvantaged children instructed in how to read

during the summer. Summer literacy day camp programs should be considered along with extended day programs that research has demonstrated are effective in high-poverty schools (U.S. Department of Education, 1999).

Finally, instead of summer school, this study taught reading in the context of a summer day camp. Camp is about social and emotional growth. Camp is about fun, increased freedom, and a different dynamic of supervision (colleaged counselors not parents or teachers). Camp is about playing, friends, acting silly, and positive summer experiences. For these reasons, the author believes that kids did not view the reading instruction as being punitive. Further, because each student was tutored one to two times per week by a volunteer, he or she developed relationships with each volunteer and felt special because the volunteer was coming to read with him or her.

The point of this research was to begin to build the case that reading instruction can be successful in environments other than school, and that Title I funds to improve the achievement of disadvantaged students can be spent over the course of the entire year. Public schools and public parks and recreation departments should form partnerships to educate children year round. The cost of sending a disadvantaged young reader to eight weeks of summer literacy camp was \$725. The lost income from high school dropouts has been estimated at more than \$238 billion (Renchler, 1993).

**Limitations of this study.** The sample size was small therefore multiple treatment conditions could not be tested. Because of limited funds, students were not randomly assigned to the literacy camp condition. Because of limited funds

and resources, only one intervention condition was tested. A larger scale study should include a wider comparison of interventions such as summer school and the inclusion of kindergarteners and second-grade students. A larger scale study with a larger sample size should also be designed to soften potential teacher effects.

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