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ABSTRACT

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Technical Report No. 209

AN INVESTIGATION OF SEX DIFFERENCES IN READING IN FOUR ENGLISH-SPEAKING NATIONS

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Statement of Focus

The Wisconsin Research and Development Center for Cognitive Learning focuses on contributing to a better understanding of cognitive learning by children and youth and to the improvement of related educational practices. The strategy for research and development is comprehensive. It includes basic research to generate new knowledge about the conditions and processes of learning and about the processes of instruction, and the subsequent development of research-based instructional materials, many of which are designed for use by teachers and others for use by students. These materials are tested and refined in school settings. Throughout these operations behavioral scientists, curriculum experts, academic scholars, and school people interact, insuring that the results of Center activities are based soundly on knowledge of subject matter and cognitive learning and that they are applied to the improvement of educational practice.

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Abstract

Investigations reported during the past century have generally shown girls to be better readers than boys in the United States. Some researchers have attributed these differences to biological-maturational factors; others have suggested cultural-societal causes. The present study sought to examine this dichotomy by testing the reading ability of boys and girls in four English-speaking nations. More than a thousand elementary children from Grades 2, 4, and 6 in Canada, England, Nigeria, and the United States participated. Each subject was tested for reading comprehension, vocabulary, and various word analysis skills. A univariate analysis of variance in which sex (2) was nested within grade (3) and grade (3) within country (4) was applied to the data for each of eight analyses. Dependent variables were raw test scores, grade equivalent scores, or composite scores. In two countries, England and Nigeria, boys generally scored higher than girls and the sex differences favoring boys increased by sixth grade. Conversely, in Canada and the United States girls generally scored higher than boys and the sex differences favoring girls diminished or disappeared by sixth grade. Results of the study indicate that sex differences in reading ability are culturally related.

I
Problem

People concerned with the education of youth have long been aware of the fact that there are differences in the way children learn. In this century considerable research has been done by psychologists and reading researchers on differences in the achievement of boys and girls, particularly in reading and related areas. There has been a general consensus that girls read better than boys, especially in the primary grades, but few attempts have been made to examine sex differences cross-culturally.

The present study was designed to investigate sex differences in reading ability among elementary school pupils in four English-speaking nations—Canada, England, Nigeria, and the United States. The study sought to answer two basic questions:

1. Within each of the four selected countries, who reads better, boys or girls?
2. If sex differences exist, at what elementary grade level are they most pronounced?

The existence of sex differences in reading achievement and prereading skills has been shown by a number of researchers. Studies by Monroe (1932), Samuels (1943), Gates (1961), and Balow (1968) have all shown significant differences favoring girls. An extensive survey concerned with more than 1 1/2 million children was reported by Shellhammer (1965), who found the most pronounced differences in mean scores favoring girls were in the areas of reading and language, and were greatest at the fifth grade level. In terms of severe reading disability, Durrell (1940) found the ratio of boys to girls was 10 to 1 in his clinic, while Mumpower (1970) reported a 7 to 3 ratio.

Certainly some sex differences do exist in learning to read. Causation of these differences has received a good deal of attention, and opinions generally fall into two broad categories. Some researchers believe the sex differences in reading—favoring girls—are caused by "psychological-biological-maturational" factors, while others attribute the differences to "societal-cultural-educational" factors.

The psychological-maturational viewpoint was widely accepted in the recent past, and still is by large numbers of people. Lincoln, in his 1927 book, *Sex Differences in the Growth of American School Children*, reported that between the ages of 7 and 12 years girls were anatomically 12 to 18 months more advanced than boys. From this physical difference Lincoln attributed academic superiority. "If it is true that girls are, in general, physically more mature than boys of corresponding age in every respect, it follows that girls should be doing more advanced work than boys or attaining higher in equal work" (p. 33). Monroe (1932) reported that boys greatly outnumbered girls in reading disability, and as a cause for this difference suggested: "Reading defects may be similar to color-blindness and a number of other biological variations in that they occur more frequently among males than among females" (p. 99).

Stephens (1951), Pauley (1951), Smith and Carrigan (1959), and Bentzen (1966) are among the researchers who advance physiological courses—skeletal differences, fetal and neo-fetal deaths, visual development, the endocrine system, and neural confusion—as proof of female superiority in learning tasks such as reading.

The use of the terms "readiness" and "maturity" by educators and researchers is often vaporous. These blanket terms frequently are defined to include physical growth and coordination, visual and aural acuity, language development, social development, and

emotional stability. Thus, "maturity" is often suggested as a source of reading ability differences, implying that differences result from largely uncontrollable factors. For example, Anderson, Hughes, and Dixon (1956) state that sex differences perhaps are due to the fact that "...girls mature more rapidly than boys, and hence become ready for reading sooner" (p. 450).

If the physiological viewpoint of sex differences in reading has validity, it must follow that these sex differences (i.e., girls reading better than boys) are evident around the globe.

Some researchers have viewed the sex differences in reading as a result of different societal or cultural expectations for boys and girls. Maccoby (1966) discusses the sex roles of children in this country showing that girls are encouraged to excel in early school years, but not so much from adolescence on, while boys in the early years are encouraged to spend more time on nonacademic activities—playing ball, etc.—but from adolescence on are expected to conform in preparation for college and work. Other researchers such as Durrell (1940), Balow (1963), Sister Mary Nila (1953), and Crandall, Katkovsky, and Preston (1962) support the societal-cultural causation of sex differences in reading.

Another dimension of the societal-cultural viewpoint is the educational environment. As early as 1908 G. Stanly Hall warned educators that feminizing the schools was influencing maladjustments in young male learners (Sweely, 1970, p. 1). Ayres stated in 1909, "...schools were geared more to the needs and natures of girls than boys. Interests of primary-grade teachers, who are mostly women, influence the environment and curriculum of the early elementary school" (Flaherty and Anderson, 1966). Others including Betts (1936), Grambs and Waetjen (1966), and Blom (1971) discuss the predominance of female teachers, feminine-oriented schools, and the need for recruiting more men into elementary education. Such researchers as Slobodian and Campbell (1967), Good and Brophy (1969), and Felsenthal (1969) showed that teachers behave differently towards boys than girls. Zimet, Blom, and Waito (1968) analyzed story content in basal readers and found a greater number of girl-activity stories, and discovered that boy-activity stories more often had a failure outcome.

If there is validity in the cultural-educational viewpoint of sex differences in reading, one would expect variation in ability differences among boys and girls in different locales, cultures, and school environments.

In 1962 Preston reported a comparison of reading achievement of German and American children in fourth and sixth grades. In tests of reading comprehension, speed, and retardation he found that with American children, the mean scores of girls were superior to those of boys on all tests in both grades, but that the reverse was true with German children. The mean scores of the German boys exceeded those of the girls on all tests except the speed score in Grade 4. Preston stated, "the apparent superiority of German boys to German girls may be due to those not easily identified elements in German culture which result in the easy ascription of reading and learning to the normal activity of the males" (p. 353). He notes that in Germany the majority of the teachers are men, while in the United States the great majority of elementary teachers are women. Though the results of his study may be somewhat clouded by the translation of the tests written in German and English, his results support a probable cultural origin of sex differences in reading achievement, rather than a physiological origin.

On the basis of Preston's findings, further exploration of reading achievement of boys and girls in various countries seemed warranted. If certain learning behaviors of boys and girls are physiologically determined, they should be evident to some degree universally, no matter what culture is involved. American educators have come to expect female superiority in reading—whatever the cause—even when it does not exist. This somewhat blind expectation is clearly exemplified in a 1971 report: "Sex had no statistically significant effect on test performance on the prereading or reading variables. However, a positive trend of superiority by girls was noted on all measures. Even though the differences were not significant, the trend does seem to support the generally acknowledged idea that girls mature linguistically and perceptually more rapidly than do boys" (McNinch, p. 489).

II
The Study

The present study was designed as a preliminary investigation of sex differences in reading among children from different countries who speak and read English. Since the sample was limited to four English-speaking nations, three grade levels, and a relatively small number of subjects at each level, the results must be viewed as tentative. The study was done between May and June, 1971. One thousand eighty-one subjects responded to six tests which measured reading comprehension, vocabulary, structural analysis, and various aspects of phonics.

Sample

The sample was selected from four English-speaking countries: Canada, England, Nigeria, and the United States. Initially a fifth country—either Kenya or South Africa—was to be included, but visa and other restrictions precluded this. Within each country, all subjects were selected from one community. Appropriate educational officials within each community were asked to select subjects that represented a cross-section of the population served. Subjects were drawn from pupils completing the second, fourth, and sixth grades of elementary school, or the equivalent. That is, students in all countries were completing their third, fifth, and seventh years of formal schooling. (I.e., the second grade subjects had completed kindergarten and first grade and were in second grade in Canada and the USA, had completed infant school years one and two and were in junior primary one in England, and had completed primary years one and two and were in primary three in Nigeria.) In Canada, England, and the USA, the ages of the majority of the second, fourth, and sixth graders were 8, 10, and 12 years. In Nigeria, however, where many children start school at a later age, the ages of the majority of subjects at each grade level were 9, 11, and 13 (see Table 1).

Canada

The St. James-Assiniboine school district has a population of 70,000 and borders Winnipeg, a city of one-half million. Residents include rural, suburban, and lower-income working-class families. The sample was drawn from four elementary schools: Assiniboia, Buchanan, Lincoln, and Phoenix. Two hundred ninety-eight subjects participated—96 second graders, 100 fourth graders, and 102 sixth graders—with nearly equal numbers of boys and girls at each grade level (see Table 1).

England

The city of Birmingham was the community from which the British subjects were drawn. Birmingham is a largely industrial city of more than a million inhabitant 80 miles northwest of London. All socioeconomic groups are found within the city. Second and fourth grade subjects (primary 1 and primary 3) attended Thornton Junior School located in a residential section of Birmingham. Grade 6 subjects (comprehensive year 1) attended nearby Washwood Heath Comprehensive School. Pupils in both schools come from white-collar, blue-collar, and recent immigrant (primarily West Indian) families. There were 292 British subjects—100 second graders (junior primary 1), 92 fourth graders (junior primary 3), and 100 sixth graders (comprehensive year 1). There were nearly equal numbers of boys and girls.

Nigeria

Zaria, North Central State, Nigeria, was the community selected for the Nigerian

TABLE 1. NUMBER OF BOYS AND GIRLS AND AVERAGE AGE OF SUBJECTS FOR EACH GRADE LEVEL IN CANADA, ENGLAND, NIGERIA, AND THE USA

		Grade 2*			Grade 4*			Grade 6*		
	Total	Boy	Girl	Age of Majority	Boy	Girl	Age of Majority	Boy	Girl	Age of Majority
Canada (St. James-Assiniboia)	298	51	45	8	52	48	10	45	57	12
England (Birmingham)	292	50	50	8	46	47	10	50	50	12
Nigeria (Zaria)	206	51	20	9	33	8	11	56	38	13
United States (Stoughton)	285	46	47	8	43	50	10	50	49	12
	Total	198	162		173	153		201	194	

*Grades 2, 4, and 6 in Canada and the United States are equivalent to junior primary 1 and 3 and comprehensive 1 in England, and to primary 3, 5, and 7 in Nigeria.

sample. Zaria, a city of about 100,000, is primarily a trading center in a largely rural area. It is also an educational center, being the site of Ahmadu Bello University, Advanced Teachers College, and several other post-primary institutions. The parents of the children were primarily farmers, traders, craftsmen, and educators. Education authorities selected three schools to participate in the study, representing the major tribal groups of the area and residential sections of Zaria. Aguwan Kahu Primary School is located in old Zaria, an ancient walled section populated mainly by Hausa people. Tuden Wada Primary School is located in the Tuden Wada section and is inhabited by many tribal groups. St. George's Primary School is located in Sabon Gari, or "strangers' quarters," a residential area inhabited primarily by Yoruba, Ibo, and other non-Hausa tribal groups. The sample consisted of 206 subjects—71 second graders (primary 3), 41 fourth graders (primary 5), and 94 sixth graders (primary 7) (see Table 1). There were only 66 female subjects, compared to about 150 in each of the other three countries. This smaller number, however, reflects the smaller proportion of girls enrolled in school in the north of Nigeria (boys outnumber girls about 3 to 1). To equalize the number of boys and girls would have created a weighting of female subjects not in harmony with the realities of educational practice there.

USA

The American subjects were drawn from the Stoughton, Wisconsin, school system. Stoughton is a city of 6,100 located about 10 miles from Madison, the state capital. The schools contain children of suburban families whose parents commute to Madison, rural families, and families engaged in light industry and trade. Second and fourth grade subjects were selected from Kegonsa and East Elementary Schools and sixth grade subjects were enrolled in Central Junior High School. There were 285 subjects—93 in Grade 2, 93 in Grade 4, and 99 in Grade 6—with sex divided about equally.

Table 1 presents the subjects who participated in the survey by sex, age, and country.

Instrumentation

A thorough review of published reading tests showed the impossibility of finding a completely "culture-free" instrument. All published tests of reading comprehension or vocabulary reviewed included some items which, because of cultural content, place references, or spelling pecularities would tend to favor children of one locale or another. However, since the purpose of this study was to examine differences in reading ability be-

tween the sexes *within* countries, and not to compare reading ability of children *between* countries, it was decided to accept the inevitability of a certain amount of cultural bias. Three tests of phonic skills and one of structural analysis were chosen for use with all subjects. Tests of comprehension and vocabulary varied according to grade, with second grade subjects taking one set of tests and fourth and sixth graders another. Table 2 lists the tests used in the study.

Eight scores were compiled for each subject: a vocabulary score, a comprehension score, three phonics scores (beginning consonants, variant consonants, long and short vowels), a phonics summary score (the sum of the three phonics test scores), a structural analysis score, and a composite reading score (the sum of all six subtest scores).

Procedures

All tests were administered by the investigator during the months of May, June, and July, 1971. Subjects were tested in groups by grade level within each school. Subjects were allowed 15 minutes for the vocabulary test, 25 minutes for the comprehension test, and 40 minutes for the four remaining tests. Rest breaks were given between each test. Fourth and sixth grade subjects used machine-scored answer sheets for the Gates-MacGinitie tests of vocabulary and comprehension. Special instructions were given in the use of these forms prior to beginning the testing. With all other tests, subjects recorded their answers on the test booklet or page. Instructions were given to each group, with the assistance of local teachers, until it was

TABLE 2. LISTS OF TESTS USED TO MEASURE VOCABULARY, COMPREHENSION, STRUCTURAL ANALYSIS, AND THREE ASPECTS OF PHONICS

Vocabulary	
(a) Grade 2:	Gates MacGinitie B, Form 1 Possible Correct: 48
(b) Grades 4 and 6:	Gates MacGinitie D, Form 1 Possible Correct: 50
Comprehension	
(a) Grade 2:	Gates MacGinitie B, Form 1 Possible Correct: 54
(b) Grades 4 and 6:	Gates MacGinitie D, Form 1 Possible Correct: 52
Structural Analysis	
Grades 2, 4, and 6:	Wisconsin Design Level B, Test 11: Base Words and Endings Possible Correct: 12
Phonics	
Grades 2, 4, and 6:	Wisconsin Design Level B, Test 3: Beginning Consonants Possible Correct: 20
Grades 2, 4, and 6:	Wisconsin Design Level C, Test 2: Variant Consonants Possible Correct: 30
Grades 2, 4, and 6:	Wisconsin Design Level C, Test 4: Possible Correct: 30

determined that the subjects understood how to take the test. The testing schedule is shown in Table 3.

TABLE 3. TESTING SCHEDULE

Place	Date
Stoughton, Wisconsin, USA	May 25-27, 1971
St. James-Assiniboia, Manitoba, Canada	June 16-18, 1971
Birmingham, England	June 28-30, 1971
Zaria, N.C. State, Nigeria	July 5-8, 1971

The Canadian, English, and American subjects were tested at the close of the school year. The Nigerian subjects were tested at the end of the second term of a three-term school year.

Design

Essentially, the study was designed to examine two questions:

1. Are there sex differences in reading achievement, as measured by the six tests, at any of the three grade levels in any of the four countries?
2. If there are differences, are they consistent across grades within a country?

Stated differently, "Do girls read better than boys? If so, is this true at all grade levels and within all four countries?"

The study was *not* designed to compare the reading abilities of Nigerian and Canadian children or English and American children. Rather, it was intended to examine sex differences in reading *within* each country, and see how these differences compared among the countries.

The investigation was constructed to test eight null hypotheses about sex differences in reading achievement:

Hypothesis One: There is no difference in the composite reading scores of boys and girls within grade (3) within country (4).

Hypothesis Two: There is no difference in the vocabulary score (grade equivalent) of boys and girls within grade (3) within country (4).

Hypothesis Three: There is no difference in the reading comprehension score (grade equivalent) of boys and girls within grade (3) within country (4).

Hypothesis Four: There is no difference in the initial consonant score (B3) of boys and girls within grade (3) within country (4).

Hypothesis Five: There is no difference in the variant consonant score (C2) of boys and girls within grade (3) within country (4).

Hypothesis Six: There is no difference in the vowel sound score (C4) of boys and girls within grade (3) within country (4).

Hypothesis Seven: There is no difference in the phonics sum score (combined B3, C2, and C4) of boys and girls within grade (3) within country (4).

Hypothesis Eight: There is no difference in the structural analysis score (B11) of boys and girls within grade (3) within country (4).

To test the hypotheses, the FINN MULTIVARIANCE computer program, which treats unequal *n*'s, was used. A univariate analysis of variance in which sex (2) was nested within grade (3) and grade (3) within country (4) was applied to the data for each of the eight analyses. In each analysis the dependent variable was the raw test score, or grade equivalent, or the composite in question.

III
Results

Tables 4 through 11 present the analysis of variance *F* values of main effects for each of the eight analyses. Following these, Tables 12 through 15 give the means and standard deviations for each cell within grade within country.

It can be seen from Table 4 that in composite reading scores, sex differences were only significant at Grade 4 in England and Grade 4 in the United States. The statistically significant differences indicated in Tables 4 through 11 are discussed in conjunction with Tables 12 through 15 which present means and standard deviations.

On the test of vocabulary, sex differences were statistically significant at Grade 6 in Canada and Grades 4 and 6 in England, as shown in Table 5.

Sex differences in reading comprehension were statistically significant at Grade 2 in Canada and Grade 4 in the United States as indicated in Table 6.

Table 7 shows that scores on Test B3: Initial Consonants were statistically significant for sex differences at Grade 4 in England and Grade 2 in Nigeria.

Table 8 reveals that the greatest amount of statistically significant sex differences occurred on Test C2: Variant Consonants (*c* → /s/ or /k/, etc.). Significant differences were found in Grades 2 and 4 in Canada, Grade 4 in England, Grade 2 in Nigeria, and Grades 2 and 4 in the United States.

It is shown in Table 9 that on Test C4: Vowels, sex differences were statistically significant in Grade 2 in Canada, Grade 4 in England, and Grade 2 in Nigeria.

In the Phonics Tests Sum (a composite score of Tests B2, C2, and C4), Table 10 shows significant sex differences in Grade 2 in Canada, Grade 4 in England, and Grade 2 in Nigeria.

Test B11 dealt with structural analysis (base words and endings). Table 11 indicates that on this test sex differences were statistically significant at Grade 4 in Canada and Grade 6 in the United States.

TABLE 4. ANALYSIS OF VARIANCE *F* VALUES FOR MAIN EFFECT SEX, WITHIN GRADE AND COUNTRY, ON COMPOSITE READING SCORE

Source of Variation	Degrees of Freedom	Hypothesis Mean Squares	*F* Values	*p* <
Sex, Grade 2, Canada	1,1056	.0000	.0193	NS
Sex, Grade 4, Canada	1,1056	.0000	1.1568	NS
Sex, Grade 6, Canada	1,1056	.0000	1.1595	NS
Sex, Grade 2, England	1,1056	.0000	.8427	NS
Sex, Grade 4, England	1,1056	.0001	4.8952	.03
Sex, Grade 6, England	1,1056	.0000	.6141	NS
Sex, Grade 2, Nigeria	1,1056	.0000	1.1306	NS
Sex, Grade 4, Nigeria	1,1056	.0000	.0327	NS
Sex, Grade 6, Nigeria	1,1056	.0000	1.8952	NS
Sex, Grade 2, USA	1,1056	.0000	.0087	NS
Sex, Grade 4, USA	1,1056	.0003	12.6563	.0004
Sex, Grade 6, USA	1,1056	.0000	2.1831	NS

TABLE 5. ANALYSIS OF VARIANCE *F* VALUES FOR MAIN EFFECT SEX, WITHIN GRADE AND COUNTRY, ON VOCABULARY SCORE

Source of Variance	Degrees of Freedom	Hypothesis Mean Squares	*F* Values	*p* <
Sex, Grade 2, Canada	6,1051	342.8354	1.6004	NS
Sex, Grade 4, Canada	6,1051	431.0027	2.0120	NS
Sex, Grade 6, Canada	6,1051	808.1667	3.7737	.05
Sex, Grade 2, England	6,1051	18.4900	.0863	NS
Sex, Grade 4, England	6,1051	2974.0522	13.8836	.0003
Sex, Grade 6, England	6,1051	1592.0100	7.4319	.006
Sex, Grade 2, Nigeria	6,1051	8.4010	.0392	NS
Sex, Grade 4, Nigeria	6,1051	86.3904	.4033	NS
Sex, Grade 6, Nigeria	6,1051	457.4685	2.1356	NS
Sex, Grade 2, USA	6,1051	317.8369	1.0284	NS
Sex, Grade 4, USA	6,1051	562.1529	2.6243	NS
Sex, Grade 6, USA	6,1051	116.9943	.5462	NS

TABLE 6. ANALYSIS OF VARIANCE *F* VALUES FOR MAIN EFFECT SEX, WITHIN GRADE AND COUNTRY, ON COMPREHENSION SCORE

Source of Variance	Degrees of Freedom	Hypothesis Mean Squares	*F* Values	*p* <
Sex, Grade 2, Canada	6,1051	1644.0497	5.1395	.03
Sex, Grade 4, Canada	6,1051	623.5997	2.0177	NS
Sex, Grade 6, Canada	6,1051	599.0343	1.9382	NS
Sex, Grade 2, England	6,1051	8.4100	.0272	NS
Sex, Grade 4, England	6,1051	564.4485	1.8263	NS
Sex, Grade 6, England	6,1051	1024.0000	3.3133	NS
Sex, Grade 2, Nigeria	6,1051	6.3475	.0205	NS
Sex, Grade 4, Nigeria	6,1051	41.9694	.1358	NS
Sex, Grade 6, Nigeria	6,1051	845.1246	2.7345	NS
Sex, Grade 2, USA	6,1051	317.8369	1.0284	NS
Sex, Grade 4, USA	6,1051	4426.1222	14.3212	.0002
Sex, Grade 6, USA	6,1051	216.8273	.7016	NS

TABLE 7. ANALYSIS OF VARIANCE *F* VALUES FOR MAIN EFFECT SEX, WITHIN GRADE AND COUNTRY, ON TEST B3: INITIAL CONSONANTS

Source of Variance	Degrees of Freedom	Hypothesis Mean Squares	*F* Values	*p* <
Sex, Grade 2, Canada	6,1051	9.7281	3.0288	NS
Sex, Grade 4, Canada	6,1051	7.0231	2.1866	NS
Sex, Grade 6, Canada	6,1051	.5636	.1755	NS
Sex, Grade 2, England	6,1051	1.6900	.5262	NS
Sex, Grade 4, England	6,1051	35.9545	11.1944	.0009
Sex, Grade 6, England	6,1051	.8100	.2522	NS
Sex, Grade 2, Nigeria	6,1051	83.2232	25.9115	.0001
Sex, Grade 4, Nigeria	6,1051	1.9424	.6048	NS
Sex, Grade 6, Nigeria	6,1051	.9855	.3068	NS
Sex, Grade 2, USA	6,1051	.2717	.0846	NS
Sex, Grade 4, USA	6,1051	.8163	.2542	NS
Sex, Grade 6, USA	6,1051	.0015	.0005	NS

TABLE 8. ANALYSIS OF VARIANCE *F* VALUES FOR MAIN EFFECT SEX, WITHIN GRADE AND COUNTRY, ON TEST C2: VARIANT CONSONANTS

Source of Variance	Degrees of Freedom	Hypothesis Mean Squares	*F* Values	*p* <
Sex, Grade 2, Canada	6,1051	249.6235	9.2561	.003
Sex, Grade 4, Canada	6,1051	99.2009	3.6784	.05
Sex, Grade 6, Canada	6,1051	.3304	.0123	NS
Sex, Grade 2, England	6,1051	51.8400	1.9222	NS
Sex, Grade 4, England	6,1051	159.7891	5.9250	.02
Sex, Grade 6, England	6,1051	4.4100	.1635	NS
Sex, Grade 2, Nigeria	6,1051	106.6397	3.9542	.05
Sex, Grade 4, Nigeria	6,1051	2.1345	.0791	NS
Sex, Grade 6, Nigeria	6,1051	49.4158	1.8323	NS
Sex, Grade 2, USA	6,1051	115.3152	4.2759	.04
Sex, Grade 4, USA	6,1051	135.7024	5.0319	.03
Sex, Grade 6, USA	6,1051	16.4914	.6115	NS

TABLE 9. ANALYSIS OF VARIANCE *F* VALUES FOR MAIN EFFECT SEX, WITHIN GRADE AND COUNTRY, ON TEST C4: VOWELS

Source of Variance	Degrees of Freedom	Hypothesis Mean Squares	*F* Values	*p* <
Sex, Grade 2, Canada	6,1051	57.1607	4.2654	.04
Sex, Grade 4, Canada	6,1051	3.9744	.2965	NS
Sex, Grade 6, Canada	6,1051	.1238	.0092	NS
Sex, Grade 2, England	6,1051	1.4400	.1074	NS
Sex, Grade 4, England	6,1051	256.4502	19.1338	.0001
Sex, Grade 6, England	6,1051	.0000	.0000	NS
Sex, Grade 2, Nigeria	6,1051	196.0485	14.6272	.0002
Sex, Grade 4, Nigeria	6,1051	5.0588	.3774	NS
Sex, Grade 6, Nigeria	6,1051	12.1349	.9054	NS
Sex, Grade 2, USA	6,1051	.8804	.0657	NS
Sex, Grade 4, USA	6,1051	1.6306	.1217	NS
Sex, Grade 6, USA	6,1051	.1616	.0121	NS

TABLE 10. ANALYSIS OF VARIANCE *F* VALUES FOR MAIN EFFECT SEX, WITHIN GRADE AND COUNTRY, FOR PHONICS (B3, C2, C4) SUMMARY

Source of Variance	Degrees of Freedom	Hypothesis Mean Squares	*F* Values	*p* <
Sex, Grade 2, Canada	1,1056	701.1622	10.7112	.001
Sex, Grade 4, Canada	1,1056	213.2675	3.2579	NS
Sex, Grade 6, Canada	1,1056	2.8138	.0430	NS
Sex, Grade 2, England	1,1056	50.4100	.7701	NS
Sex, Grade 4, England	1,1056	1200.6947	18.3422	.0001
Sex, Grade 6, England	1,1056	9.0000	.1375	NS
Sex, Grade 2, Nigeria	1,1056	1118.9732	17.0938	.0001
Sex, Grade 4, Nigeria	1,1056	.3667	.0056	NS
Sex, Grade 6, Nigeria	1,1056	132.3853	2.0224	NS
Sex, Grade 2, USA	1,1056	148.7934	2.2730	NS
Sex, Grade 4, USA	1,1056	191.2573	2.9217	NS
Sex, Grade 6, USA	1,1056	19.5754	.2990	NS

TABLE 11. ANALYSIS OF VARIANCE *F* VALUES FOR MAIN EFFECT SEX, WITHIN GRADE AND COUNTRY, FOR TEST B11: STRUCTURAL ANALYSIS

Source of Variance	Degrees of Freedom	Hypothesis Mean Squares	*F* Values	$p <$
Sex, Grade 2, Canada	6,1051	14.3163	2.6494	NS
Sex, Grade 4, Canada	6,1051	22.0125	4.0736	.05
Sex, Grade 6, Canada	6,1051	1.3760	.2546	NS
Sex, Grade 2, England	6,1051	16.0000	2.9610	NS
Sex, Grade 4, England	6,1051	5.7093	1.0566	NS
Sex, Grade 6, England	6,1051	13.6900	2.5335	NS
Sex, Grade 2, Nigeria	6,1051	.7822	.1447	NS
Sex, Grade 4, Nigeria	6,1051	7.0377	1.3024	NS
Sex, Grade 6, Nigeria	6,1051	2.5629	.4743	NS
Sex, Grade 2, USA	6,1051	10.4457	1.9331	NS
Sex, Grade 4, USA	6,1051	5.1626	.9554	NS
Sex, Grade 6, USA	6,1051	59.5341	11.0174	.001

Tables 12 through 15 present the mean scores and standard deviations for boys and girls at each of the three grade levels in each of the four countries on the six tests, the phonics summary, and the composite score. The vocabulary and comprehension scores are grade level equivalents. Each of the other scores is a raw score mean. Vocabulary and comprehension received a heavier weighting in the composite score, which seemed appropriate. The composite score was a linear combination of individual raw scores and grade equivalents with grade equivalent scores being multiplied by 10, compensating for the smaller range of the grade equivalent score. Thus, a vocabulary grade level equivalent score of 4.00 became 40.0 when included in the composite.

Mean scores and standard deviations for boys and girls in Grades 2, 4, and 6 in the Canadian sample are presented in Table 12.

It can be seen from Table 12 that of 24 score comparisons (boys versus girls on eight scores at three grade levels) girls in Canada surpassed boys on 18, while boys surpassed girls on 6, all in Grade 6. Differences in the word analysis scores of boys and girls at the different grade levels are slight, while vocabulary and comprehension differences are greater. Table 4 shows no statistically significant differences in the *composite scores* by sex within grade level. On individual test scores, however, there were significant differences, and most of these occurred at Grade 2. As shown in Tables 6, 8, 9, 10, and 12, second grade girls surpassed boys in comprehension ($p < .03$), variant consonants ($p < .003$), vowels ($p < .04$), and the phonics summary ($p < .001$). In Grade 4 girls performed significantly better than boys on the test of variant consonants ($p < .05$) and in structural analysis ($p < .05$), as indicated by Tables 8, 11, and 12. The only statistically significant difference in Grade 6 was on the vocabulary test where boys surpassed girls ($p < .05$). (See Tables 5 and 12.) Thus in the early elementary grades, Canadian girls appear to read better than boys, while in Grade 6 the reverse is true, though few of these differences are significant.

Table 13 presents the mean scores and standard deviations for boys and girls at Grades 2, 4, and 6 (junior primary 1 and 3 and comprehensive 1) for the Birmingham, England, subjects.

Table 13 shows that, generally, boys performed better than girls in England. Mean scores of boys surpassed those of girls on 17 of 24 score comparisons (eight scores at each of three grades). Mean scores were identical for sixth grade boys and girls on Test C4: Vowel Sounds. Girls surpassed boys on certain word analysis scores in Grades 2 and 6. It can be seen from Table 4 that the only statistically significant difference in the composite scores was at the fourth grade level favoring boys [$p < .05$].

There were no statistically significant differences at Grade 2 (junior primary 1) and only one at Grade 6 (comprehensive 1) where the vocabulary scores of boys were significantly higher than those of girls ($p < .006$—see Table 5). However there were more significant sex differences in Grade 4 (junior

TABLE 12. TEST MEAN SCORES AND STANDARD DEVIATIONS FOR BOYS AND GIRLS AT GRADES 2, 4, AND 6 IN ST. JAMES-ASSINIBOIA, MANITOBA, CANADA

	Grade 2				Grade 4				Grade 6			
	Girl N = 45		Boy N = 51		Girl N = 48		Boy N = 52		Girl N = 57		Boy N = 45	
	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.
Vocabulary*	4.00	1.03	3.62	1.12	5.12	1.47	4.71	1.16	7.98	2.23	8.55	2.07
Comprehension*	4.14	1.04	3.31	1.19	4.09	1.21	3.59	1.22	7.79	2.65	7.30	2.98
B3: Beginning Consonants	19.42	1.10	18.78	1.86	19.39	1.22	18.86	1.68	19.56	.73	19.71	.55
C2: Variant Consonants	21.80	5.99	18.56	7.22	24.41	3.71	22.42	6.50	25.92	3.99	26.04	3.25
C4: Vowel Sounds	27.97	2.41	26.43	4.42	26.43	4.00	26.03	4.24	28.59	2.00	28.66	1.54
Phonics Sum	68.20	7.39	63.78	9.92	70.25	6.65	67.32	9.92	74.08	5.53	74.42	4.18
B11: Structural Analysis	10.57	2.62	9.80	3.18	11.45	1.25	10.51	2.40	11.78	.62	11.55	1.20
Composite	161.28	7.40	143.01	10.56	173.95	6.65	160.94	9.93	243.66	5.54	244.55	4.19

*Grade Level Equivalence Scores

TABLE 13. TEST MEAN SCORES AND STANDARD DEVIATIONS FOR BOYS AND GIRLS AT GRADES 2, 4, AND 6 IN BIRMINGHAM, ENGLAND

	Grade 2				Grade 4				Grade 6			
	Girl N = 50		Boy N = 50		Girl N = 47		Boy N = 45		Girl N = 50		Boy N = 50	
	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.
Vocabulary*	2.83	1.29	2.92	1.28	3.99	1.56	5.12	1.67	5.47	1.92	6.27	2.26
Comprehension*	2.87	1.16	2.81	1.17	3.94	1.71	4.44	1.70	5.69	2.14	6.33	2.87
B3: Beginning Consonants	18.68	1.50	18.42	1.73	17.63	2.62	18.88	1.92	18.64	2.32	18.46	2.16
C2: Variant Consonants	13.82	6.78	15.26	6.50	17.31	6.21	19.95	6.22	22.96	4.66	22.54	5.49
C4: Vowel Sounds	18.88	5.49	19.12	5.87	20.14	5.18	23.48	3.78	24.96	4.37	24.66	3.70
Phonics Sum	51.38	11.12	52.80	11.01	55.10	11.02	62.33	8.91	66.26	8.99	65.66	9.49
B11: Structural Analysis	7.50	2.94	6.50	3.39	8.21	3.54	8.71	3.02	10.34	2.13	9.60	2.78
Composite	116.00	11.13	116.90	11.01	142.72	11.02	166.71	8.92	188.36	9.00	201.40	9.49

*Grade Level Equivalence Scores

TABLE 14. TEST MEAN SCORES AND STANDARD DEVIATIONS FOR BOYS AND GIRLS AT GRADES 2, 4, AND 6 IN ZARIA, NIGERIA

	Grade 2				Grade 4				Grade 6			
	Girl N = 20		Boy N = 51		Girl N = 8		Boy N = 33		Girl N = 38		Boy N = 56	
	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.
Vocabulary*	1.10	0.11	1.17	0.18	2.91	0.60	3.27	0.88	3.92	0.94	4.37	0.92
Comprehension*	1.31	0.24	1.37	0.22	2.37	0.39	2.63	0.36	3.36	0.71	3.97	0.67
B3: Beginning Consonants	12.75	3.06	15.15	3.44	17.12	2.23	16.57	2.77	18.68	1.40	18.89	1.27
C2: Variant Consonants	7.55	3.52	10.27	3.86	15.00	2.33	14.42	4.58	18.73	4.52	20.21	4.18
C4: Vowel Sounds	11.60	2.48	15.29	2.99	15.75	2.66	16.63	3.99	19.50	3.51	20.23	3.70
Phonics Sum	31.90	6.29	40.72	7.41	47.87	4.64	47.63	8.05	56.92	6.70	59.33	9.49
B11: Structural Analysis	5.10	1.83	5.33	1.72	7.50	1.20	6.45	2.65	10.34	2.21	10.67	1.99
Composite	61.10	6.30	71.58	7.42	108.25	4.64	113.18	8.06	140.15	6.71	153.51	5.60

*Grade Level Equivalence Scores

TABLE 15. TEST MEAN SCORES AND STANDARD DEVIATIONS FOR BOYS AND GIRLS AT GRADES 2, 4, AND 6 IN STOUGHTON, WISCONSIN, USA

	Grade 2				Grade 4				Grade 6			
	Girl N = 47		Boy N = 46		Girl N = 50		Boy N = 43		Girl N = 49		Boy N = 50	
	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.
Vocabulary*	3.98	.90	3.61	1.02	5.62	1.45	5.13	1.37	7.32	1.78	7.54	1.81
Comprehension*	3.75	1.03	3.38	1.08	5.48	1.87	4.10	1.35	7.00	2.91	6.70	2.82
B3: Beginning Consonants	18.97	1.74	18.86	1.89	19.56	1.13	19.37	1.11	19.61	.70	19.62	.81
C2: Variant Consonants	22.39	4.59	20.15	6.97	25.26	3.74	22.83	5.99	26.81	2.77	26.00	3.90
C4: Vowel Sounds	26.95	3.75	26.76	3.68	28.94	2.24	28.67	1.51	29.04	1.99	28.96	1.92
Phonics Sum	68.32	8.14	65.78	9.59	73.76	5.87	70.88	6.77	75.46	4.12	74.42	5.33
B11: Structural Analysis	10.52	2.14	9.84	2.58	11.24	1.46	10.76	1.82	11.55	.98	10.00	2.20
Composite	156.17	8.14	145.60	9.59	196.14	5.87	174.02	6.78	230.30	4.13	227.08	5.33

*Grade Level Equivalence Scores

primary 3) than in any other grade in any of the countries in the study. Boys' scores were significantly better than those of girls on four subtests: vocabulary ($p < .0003$, Table 5), beginning consonants ($p < .0009$, Table 7), variant consonants ($p < .02$, Table 8), and vowels ($p < .0001$, Table 9), as well as on the phonics summary ($p < .0001$, Table 10) and the overall composite score ($p < .03$, Table 4).

In summary, Table 13 shows that in the English sample, the boys generally read better than the girls, and this was particularly true at Grade 4 (junior primary 3).

Table 14 presents the test mean scores for boys and girls at Grades 2 (primary 3), 4 (primary 5), and 6 (primary 7) in Zaria, Nigeria.

Comparing the means for Nigerian boys and girls, presented in Table 14, reveals that boys surpassed girls on 20 of 24 scores (eight scores at each of three grade levels), while girls had higher scores than boys on four. Girls' scores were slightly higher than boys' on Tests B3: Beginning Consonants, C2: Variant Consonants, the phonics sum score, and B11: Structural Analysis—all at Grade 4 (primary 5). In all comparisons for Grade 2 and 6 subjects, and for the remaining comparisons in Grade 4, the boys' mean scores were higher than the girls.

However, there were no statistically significant sex differences in Grade 4 (primary 5) and Grade 6 (primary 7). Four significant differences, all favoring boys, occurred at Grade 2 (primary 3) and all were in the phonics skills. Second grade boys' scores were significantly higher than girls' on beginning consonants ($p < .0001$, Table 7), variant consonants ($p < .05$, Table 8), vowels ($p < .0002$, Table 9), and on the phonics summary ($p < .0001$, Table 10). Table 13 shows that while the mean composite scores of the boys were higher than the mean composite scores of the girls at all three grade levels, the differences were not statistically significant.

Table 15 presents the mean scores for boys and girls in Grades 2, 4, and 6 for the American subjects.

Table 15 indicates that American girls did better than the boys on almost all aspects of reading measured, and at all three grade levels. The mean scores of girls were higher than those of boys on 22 of 24 comparisons (eight scores at each of three grade levels). At Grade 6 a slight difference favored boys in vocabulary and there was a negligible difference in Test B3: Initial Consonants. Table 4 shows that in composite scores, the only statistical difference between girls and boys occurred at Grade 4 ($p < .0004$).

Girls scored significantly better than boys on the test of variant consonants at both the second grade ($p < .04$, Table 8) and the fourth grade ($p < .03$, Table 8). The only other statistically significant difference was on Test B11: Structural Analysis, with the girls performing better ($p < .001$, Table 11) in Grade 6.

One additional table is included to show the difference in general performance in the four countries. Within each country, 24 scores were compared for boys and girls. These were the scores on six tests: vocabulary, comprehension, structural analysis, beginning consonants, variant consonants, and vowels, plus a phonics summary (the total mean score for the three phonics tests) and a composite score (the total mean score for all six tests, with vocabulary and comprehension receiving a higher weighting). Table 16 presents the number of mean scores which were higher for boys or for girls in each of the four countries.

It is evident from Table 16 that in two countries, England and Nigeria, the boys scored better than the girls on the majority of the 24 mean score comparisons. Conversely, in the United States and Canada, the girls scored better than the boys on the majority of the measures. It seems apparent that sex differences in reading must be attributed primarily to *cultural* rather than to *physiological* determinants.

TABLE 16. COMPARATIVE PERFORMANCE OF BOYS AND GIRLS OF THE 24 READING SCORES IN CANADA, ENGLAND, NIGERIA, AND THE USA

Country	Number of 24 Comparisons on which *Girls* scored higher than Boys	Number of 24 Comparisons on which *Boys* scored higher than Girls	Same
Canada	18	6	
USA	22	2	
England	6	17	1
Nigeria	4	20	

TABLE 17. SEX AND RANGE OF EXPERIENCE OF TEACHERS OF SUBJECTS, AND THEIR OPINION OF SEX SUPERIORITY IN READING ACHIEVEMENT

Country	Male	Female	Range of Experience	Girls Read Better	Boys Read Better	No Difference
Canada	0	10	1 to 28 years	80%	20%	
England	4	5	2 to 24 years	66%	33%	
Nigeria	3*	4*	1 to 17 years	0%	100%	
USA	2	17	2 to 34 years	78%	0%	22%

*While there was one more female teacher than male teacher in the Nigerian sample in this study, throughout Zaria providence about 75% of the elementary teachers are males and the proportion of male teachers is higher in other parts of Northern Nigeria.

Teacher Survey

The teachers of the subjects were asked questions regarding their preparation and years of experience. They were also asked to respond to the question: "In general, who are your better readers, boys or girls?" Forty-five teachers were surveyed, the total number of teachers from whose classes all subjects were drawn. Table 17 presents the sex of the teachers involved, the range of years of experience and the percentages of teachers who thought girls or boys were superior readers.

Table 17 shows that while in Canada and the United States the great majority of teachers believe the girls are superior readers, in Nigeria all teachers surveyed believed boys to be better readers than girls. The English teachers thought the girls better readers than the boys, but not to the extent found in Canada and the United States. The proportion of male teachers is higher in England and Nigeria than in Canada and the United States (in Zaria Province, Nigeria, 75% of the elementary teachers are male). The range of teaching experience was not as great among the Nigerian teachers surveyed as within the other countries.

Limitations

The results can be interpreted only in light of two limitations.

1. *The sample*—Only one small geographical area was sampled in each of the four countries. Appropriate school officials were asked to select a representative cross-section of the population served. Thus generalizing beyond the areas sampled in the four countries would be unwarranted. Similarly, the four countries studied should not be considered representative of all English-speaking nations.
2. *Instrumentation*—An inevitable cultural bias accrues to the Canadian and American subjects since all tests used were developed in the United States. The development of relatively culture-free reading achievement tests in English would prove useful to cross-cultural studies such as the present one.

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IV
Discussion

The current study seems to support the conclusions of Preston; i.e., sex differences in reading are more culturally than physiologically determined (1962). If, as Lincoln (1927), Bentzen (1966), and others advance, sex differences in reading are physiologically, biologically, and maturationally determined—with girls nearly always achieving better than boys in the early elementary grades—then any apparent sex difference in the current data should have held across countries. It did not. While the number of statistically significant sex differences were few (only 23 of 96 comparisons—8 scores x 3 grades x 4 countries—were significant at $p < .05$ or better), there was a clear cut difference in *which* sex performed better within the country. In England and Nigeria the boys scored better than the girls on more than two-thirds of the tests, whereas in Canada and the United States girls scored better than boys on three-fourths or more of the tests. There are several possible explanations for these differences.

Elementary school children in Canada and the United States are instructed by proportionally more female teachers than are the children in England and Nigeria. In fact in the northern provinces of Nigeria most elementary school teachers are men. It seems plausible that some male students might achieve better in a classroom environment established by a male teacher. Few American and Canadian children encounter this possibility before fifth or sixth grade at the earliest.

Related to this is the possibility of a Pygmalion effect. Table 17 indicates that the teachers of the children included in this study were either very astute judges of who their better readers were, or that children perform as their teachers expect them to. About 80% of the Canadian and American teachers judged their girls to be better readers, while all of the Nigerian teachers and a third of the English teachers believed their boys to be the better readers.

Parental and societal expectations for boys and girls vary among nations. For a sizable number of adults in North America reading is still considered a somewhat "sissy" or "feminine" pastime for young children. Many fathers would rather see their young sons toss a football or play hockey than stay inside and read a book. Hopefully, an increased interest in women's liberation and the increasing awareness of the nonconscious ideology of sex-role typing perhaps will create attitudinal changes toward "who should read."

In the north of Nigeria, predominantly a Muslim area, schooling is much more highly valued for males than females. While most families desire an education for their sons, the education of their daughters has a lower priority. Thus reading is considered by many to be a "male" activity. In England, as in many European countries, success in schooling is considered every bit as important for boys as for girls, if not more so. What families and societies value and reward, consciously or nonconsciously, has an effect on the behavior of groups within the society and family, particularly young children (Bem, 1970). Reading ability of boys is certainly more highly valued in England and Nigeria than in Canada and the United States, particularly in the early school years.

A third factor, not analyzed in the present study, which could influence the performance of boys and girls is the cultural and sex-related content of beginning reading materials. In this investigation no attempt was made to analyze story content of materials being used to teach reading.

Two other results merit discussion. The first has to do with increase or decrease of

sex differences within countries as children progress through the elementary grades. The four tables of means (12, 13, 14, and 15) reveal this progression, particularly in the composite mean scores. In the two countries in which the girls read better than the boys, Canada and the United States, these differences diminished considerably or disappeared by the sixth grade. There were practically no differences in composite mean scores for sixth grade boys and girls in either Canada or the United States. In the two countries in which the boys read better than the girls, England and Nigeria, by sixth grade the sex differences (favoring boys) were greater than at the second grade. Thus in the countries where girls initially read better than boys, the differences virtually disappeared with the older subjects, but in the countries where the boys initially read somewhat better than the girls, the differences were greater with the older subjects. There is nothing in the present data to warrant a speculation about these disparate trends.

A final point deals with the type of test providing the greatest differences. On only one test were the sex differences statistically significant in half of the 12 comparisons (3 grades x 4 countries). Test C2: Variant Consonants was significant at Grades 2 and 4 in Canada, Grade 4 in England, Grade 2 in Nigeria, and Grades 2 and 4 in the United States. In Canada and the United States girls did better than boys, while in England and Nigeria boys scored higher than girls. On all other tests or composites there were no more than three significant differences. That the variant consonant test provided the greatest amount of significant differences is somewhat surprising. It is one of the most "culture free" of the six tests, basically requiring the matching of variant consonant sounds within synthetic and real words (for example, *cib*; is *c* the same as in *city* or *cube*?). On the other hand, of all three phonics tests, this one proved to be the most difficult at all three grade levels in all four countries (see Tables 12, 13, 14, and 15). Thus, a test of variant consonants such as the one used in this study might prove useful as a predictor of sex differences in a variety of target populations.

In summary, sex differences in reading ability seem to be culturally related. In this study, boys read better than girls in England and Nigeria, whereas girls read better than boys in Canada and the United States. Sex differences favoring girls diminished or disappeared by sixth grade in Canada and the United States, while sex differences favoring boys increased by sixth grade in England and Nigeria. More significant sex differences occurred on the test of variant consonants than on any other reading test administered.

Research Implications

There are two major implications for future research suggested by the data.

1. A broader cross-cultural study of sex differences in reading achievement in English-speaking nations should be undertaken. More countries (for example, Australia, Kenya, Ghana, South Africa, New Zealand, Ireland, etc.) should be included; and more sophisticated sampling techniques within countries should be employed. Developmental trends within countries—perhaps through the use of longitudinal studies—should be carefully analyzed. Inasmuch as possible, culture-free reading tests should be developed and used in such a cross-cultural study.
2. Though the intent of this study was not to compare the reading performance of children in one country with children in another country, it is apparent from the mean scores presented in Tables 12 through 15 that reading achievement in England and Nigeria is less than that in Canada and the United States. This is not surprising for Nigeria since English is a second language there, and many children never speak the language, let alone read it, before entering elementary school. Undoubtedly for both England and Nigeria, the fact that American tests were used contributed to lower scores. Nevertheless, it would be very useful to compare reading abilities across countries—especially if culture-free tests were developed. Careful analysis of the results of such a study could have great pedagogical implications for all nations involved. Successful developments in reading instruction in one country or another might become apparent, and the communication of such advances could contribute to a greater world literacy.

Educational Implications

The present data suggest one obvious educational implication for this country. Far too many American elementary teachers and reading educators *expect* their girls to read better than their boys, and consciously or nonconsciously view this difference as universal and unalterable. Greater awareness of the apparent fact that girls do not innately read better than boys could change educational practice—if not societal expectations. This is not to suggest that more male teachers should be hired for elementary schools—which would not be very practical even if desirable—but that teachers should evaluate their attitudes and practices with regard to the reading activities, materials, and expectations for *all* the individuals in their classrooms, regardless of sex.

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