

THE EFFECT OF RADIO PROGRAMS ON SILENT READING
ACHIEVEMENT OF NINETY-ONE SIXTH
GRADE STUDENTS

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Editors Note: Many persons have expressed interest in the effects of the radio upon school work. The author of this paper studies the relation between certain selected radio programs and achievement in silent reading.

THE radio has become an integral part of American culture. It seems pertinent, therefore, to determine by scientific investigation whether radio broadcasts have any effect on the ability of pupils to concentrate sufficiently on their studies in order to acquire knowledge and information. Since progress in most school subjects depends largely on the ability of pupils to read rapidly and intelligently, it seemed advisable to administer a silent reading test with and without radio programs.

PROBLEM

What effect will the broadcast of a musical radio program and a variety radio program have on the silent reading achievement of sixth grade students?

ADMINISTRATION OF THE TESTS

The subjects used were three unselected groups of sixth grade students in the public schools of Carlisle, Pennsylvania. The total number participating was ninety-one students. Intelligence quotients were secured for eighty-eight students by administration of the Otis Test of Mental Maturity.¹ The silent reading test selected for the experiment was the Iowa Silent Reading Test for Grades 4-9, Forms Am, Bm, and Cm.² These tests measure a wide range of skills indispensable to effective reading of the work-study type. They are analytical, measuring rate of reading, comprehension, word meaning, and ability to use skills in locating information. Grade percentile norms are based on 60,000 cases. Split half reliability coefficients are .93. Kuder-Richardson reliability coefficients for each grade average .95 for the Elementary Test.

¹ *Otis Quick-Scoring Mental Ability Test*, World Book Company, Yonkers-on-Hudson, New York.

² *Iowa Silent Reading Test*, World Book Company, Yonkers-on-Hudson, New York.

The statistical formula used for computing the standard error of the difference between the means was devised by Peters and Van Voorhis.¹

As a preliminary to the study the students were asked to indicate three choices of variety radio programs and three choices of musical radio programs. Tabulation of these choices revealed that the two variety radio programs receiving the highest number of votes were Dagwood and Blondie and Edgar Bergen's Charlie McCarthy. The musical radio programs receiving the highest number of votes were the Hour of Charm and the Hit Parade. A half hour transcription was made of each of these programs since the time required for administering each test was approximately fifty minutes. Form Am was administered with no radio program; Form Bm was administered with the variety program (Dagwood and Blondie and Charlie McCarthy); Form Cm was administered with the musical program (Hour of Charm and Hit Parade).

The three forms of the test were administered on three successive days. In order to eliminate the effects of practice the rotation technique was used.

Group	Form of Test		
1----Am(no radio program)	Bm(variety program)	Cm(musical program)	
2----Bm(variety program)	Cm(musical program)	Am(no radio program)	
3----Cm(musical program)	Am(no radio program)	Bm(variety program)	

The students were unaware of the purpose of the tests. Prior to administration of Forms Bm and Cm the examiner stated merely that during the test period a radio program would be heard. After the administration of Forms Bm and Cm the students were asked to indicate by using the words yes or no whether they studied at home during radio programs. This information was secured in order to determine which students were more or less conditioned and which were not conditioned to radio programs.

INTERPRETATION OF RESULTS

Table I shows the comparison of the achievement of the whole group on the reading test administered without a radio program and with a variety radio program. The difference between the means was 2.98 in favor of the test administered without a radio program. The ratio of the mean difference to its standard error was 2.6. This ratio is statistically significant by conventional standards since it passes the so called one per cent point.

¹ Peters, C. C., and Van Voorhis, W. R., *Statistical Procedures and Their Mathematical Bases* (1940), p. 165.

TABLE I
COMPARISON OF THE READING ACHIEVEMENT OF 91 SIXTH GRADE STUDENTS
WITHOUT A RADIO PROGRAM AND WITH A VARIETY PROGRAM

Form	Mean	Standard Error of the Difference Between Means	Critical Ratio
Am(no radio program).....	147.31	1.14	2.6
Bm(variety program).....	144.33		
Diff.....	2.98		

Table II shows the comparison of the achievement of the whole group on the reading test administered without a radio program and with a musical radio program. The difference between the means was .11 in favor of the test administered without a radio program. The ratio of the mean difference to its standard error was .11 which is statistically insignificant. This would indicate that the musical radio program had no adverse effect on the reading achievement.

TABLE II
COMPARISON OF THE READING ACHIEVEMENT OF 91 SIXTH GRADE STUDENTS
WITHOUT A RADIO PROGRAM AND WITH A MUSICAL PROGRAM

Form	Mean	Standard Error of the Difference Between Means	Critical Ratio
Am (no radio program).....	147.31	1.02	.11
Cm (musical program).....	147.20		
Diff.....	.11		

In order to determine whether sex was a significant factor in achievement under the experimental conditions means were computed for 47 girls and for 44 boys. Table III shows that the difference between the means for the girls on the reading test administered without a radio program and with a variety radio program was 2.85 in favor of the test administered without a radio program. The ratio of the mean difference to its standard error was 1.7. This is an appreciable difference, but does not quite reach the conventional levels demanded for statistical significance. Nevertheless, so great a difference would be gotten by chance only about four times in one hundred on the obtained side.

TABLE III

COMPARISON OF THE READING ACHIEVEMENT OF 47 SIXTH GRADE GIRLS WITHOUT A RADIO PROGRAM AND WITH A VARIETY RADIO PROGRAM

Form	Mean	Standard Error of the Difference Between Means	Critical Ratio
Am (no radio program)	150.04	1.66	1.7
Bm (variety program)	147.19		
Diff.	2.85		

Table IV shows that the difference between the means for the girls on the reading test administered without a radio program and with a musical radio program was .76 in favor of the test administered without a radio program. The ratio of the mean difference to its standard error was .51 which is statistically insignificant. This would indicate that the musical radio program did not seriously affect the reading achievement of this group.

TABLE IV

COMPARISON OF THE READING ACHIEVEMENT OF 47 SIXTH GRADE GIRLS WITHOUT A RADIO PROGRAM AND WITH A MUSICAL RADIO PROGRAM

Form	Mean	Standard Error of the Difference Between Means	Critical Ratio
Am (no radio program)	150.04	1.4	.51
Cm (musical program)	149.28		
Diff.76		

TABLE V

COMPARISON OF THE READING ACHIEVEMENT OF 44 SIXTH GRADE BOYS WITHOUT A RADIO PROGRAM AND WITH A VARIETY RADIO PROGRAM

Form	Mean	Standard Error of the Difference Between Means	Critical Ratio
Am (no radio program)	144.39	1.57	2.0
Bm (variety program)	141.27		
Diff.	3.12		

Table V shows that the difference between the means for the boys on the reading test administered without a radio program and with a variety radio program was 3.12 in favor of the test administered without a radio program. The ratio of the mean difference to its standard error was 2.0. This ratio is statistically significant by conventional standards since it passes the five per cent point.

TABLE VI

COMPARISON OF THE READING ACHIEVEMENT OF 44 SIXTH GRADE BOYS WITHOUT A RADIO PROGRAM AND WITH A MUSICAL RADIO PROGRAM

Form	Mean	Standard Error of the Difference Between Means	Critical Ratio
Am (no radio program).....	144.39	1.54	.38
Cm (musical program).....	144.98		
Diff.....	.59		

Table VI shows the difference between the means for the boys on the reading test administered without a radio program and with a musical radio program was .59 in favor of the test administered with the musical radio program. The ratio of the mean difference to its standard error is .38 which is statistically insignificant. This would indicate that the reading achievement of this group was not affected by the musical radio program.

TABLE VII

COMPARISON OF THE READING ACHIEVEMENT OF 37 SIXTH GRADE STUDENTS WITHOUT A RADIO PROGRAM AND WITH A VARIETY RADIO PROGRAM (I.Q. ABOVE 100)

Form	Mean	Standard Error of the Difference Between Means	Critical Ratio
Am (no radio program).....	156.84	1.83	.09
Bm (variety program).....	156.68		
Diff.....	.16		

In order to determine whether intelligence was a significant factor in achievement under the experimental conditions means were computed for 37 students whose I. Q.'s ranged from 101 to 157; for 19 students whose

I. Q.'s ranged from 90 to 100; and for 32 students whose I. Q.'s ranged from 61 to 90. Table VII shows that the difference between the means on the reading test administered without a radio program and with a variety radio program for the group whose I. Q.'s were above 100 was .16 in favor of the test administered without a radio program. The ratio of the mean difference to its standard error was .09 which is statistically insignificant. This would indicate that the reading achievement of this group was not affected by the variety radio program.

Table VIII shows that the difference between the means on the reading test administered without a radio program and with a musical radio program for the group whose I. Q.'s were above 100 was 3.97 in favor of the test administered with a musical radio program. The ratio of the mean difference to its standard error was 3.2 which is statistically significant. This indicates that with this group the reading achievement was greater on the test administered with the radio musical program.

TABLE VIII
COMPARISON OF THE READING ACHIEVEMENT OF 37 SIXTH GRADE STUDENTS
WITHOUT A RADIO PROGRAM AND WITH A MUSICAL RADIO
PROGRAM (I.Q. ABOVE 100)

Form	Mean	Standard Error of the Difference Between Means	Critical Ratio
Am (no radio program) -----	156.84	1.26	3.2
Cm (musical program) -----	160.81		
Diff. -----	3.97		

Table IX shows that the difference between the means on the reading test administered without a radio program and with a variety radio program for the group whose I.Q.'s ranged from 90 to 100 was 5.79 in favor of the test administered without a radio program. The ratio of the mean difference to its standard error was 1.9. This is an appreciable difference, but does not quite reach the so called five per cent point. Nevertheless so great a difference would be gotten by chance only about three times in one hundred. This would indicate that the reading achievement was somewhat affected by the variety radio program.

TABLE IX

COMPARISON OF THE READING ACHIEVEMENT OF 19 SIXTH GRADE STUDENTS
WITHOUT A RADIO PROGRAM AND WITH A VARIETY RADIO
PROGRAM (I.Q. 90-100)

Form	Mean	Standard Error of the Difference Between Means	Critical Ratio
Am (no radio program)	145.74	3.04	1.9
Bm (variety program)	139.95		
Diff.....	5.79		

Table X shows that the difference between the means on the reading test administered without a radio program and with a musical radio program for the group whose I. Q.'s ranged from 90 to 100 was 4.00 in favor of the test administered without a radio program. The ratio of the mean difference to its standard error was 1.4 which is statistically insignificant. This would indicate that the musical radio program had little adverse effect on the reading achievement of this group.

TABLE X

COMPARISON OF THE READING ACHIEVEMENT OF 19 SIXTH GRADE STUDENTS
WITHOUT A RADIO PROGRAM AND WITH A MUSICAL RADIO
PROGRAM (I.Q. 90-100)

Form	Mean	Standard Error of the Difference Between Means	Critical Ratio
Am (no radio program)	145.74	2.95	1.4
Cm (musical program)	141.74		
Diff.....	4.00		

Table XI shows that the difference between the means on the reading test administered without a radio program and with a variety program for the group whose I. Q.'s were below 90 was 2.79 in favor of the test administered without a radio program. The ratio of the mean difference to its standard error was 1.9. This is an appreciable difference, but does not quite reach the five per cent point. Nevertheless so great a difference would be gotten by chance only about three times in one hundred. This would indicate that the reading achievement of this group was somewhat affected by the variety radio program.

TABLE XI
COMPARISON OF THE READING ACHIEVEMENT OF 32 SIXTH GRADE STUDENTS
WITHOUT A RADIO PROGRAM AND WITH A VARIETY RADIO
PROGRAM (I.Q. BELOW 90)

Form	Mean	Standard Error of the Difference Between Means	Critical Ratio
Am (no radio program)	136.63	1.49	1.9
Bm (variety program)	133.84		
Diff.	2.79		

Table XII shows that the difference between the means on the reading test administered without a radio program and with a musical radio program for the group whose I. Q.'s were below 90 was .72 in favor of the test administered without a radio program. The ratio of the mean difference to its standard error was .46 which is not statistically significant. This would indicate that the musical radio program had little adverse effect on the reading achievement of this group.

TABLE XII
COMPARISON OF THE READING ACHIEVEMENT OF 32 SIXTH GRADE STUDENTS
WITHOUT A RADIO PROGRAM AND WITH A MUSICAL RADIO
PROGRAM (I.Q. BELOW 90)

Form	Mean	Standard Error of the Difference Between Means	Critical Ratio
Am (no radio program)	136.63	1.56	.46
Cm (musical program)	135.91		
Diff.72		

Means were also obtained for the 61 students who indicated that they were accustomed to studying at home during radio programs and for the 30 students who indicated that they were not accustomed to studying at home during radio programs. It was impossible to determine scientifically the amount of conditioning which had taken place, so this must be regarded as a variable factor. Table XIII shows that the difference between the means on the reading test administered without a radio program and with a variety radio program for those who were more or less conditioned was 4.59 in

favor of the test administered without a radio program. The ratio of the mean difference to its standard error was 3.2 which is statistically significant. This indicates that with this group the variety radio program had an adverse effect on reading achievement.

TABLE XIII
COMPARISON OF THE READING ACHIEVEMENT OF 61 CONDITIONED STUDENTS
WITHOUT A RADIO PROGRAM AND WITH A VARIETY RADIO PROGRAM

Form	Mean	Standard Error of the Difference Between Means	Critical Ratio
Am (no radio program)	147.56	1.44	3.2
Bm (variety program)	142.97		
Diff.	4.59		

Table XIV shows that the difference between the means on the reading test administered without a radio program and with a musical radio program for those who were more or less conditioned was 1.64 in favor of the test administered without a radio program. The ratio of the mean difference to its standard error was 1.3 which is statistically insignificant. This would indicate that the musical radio program had little adverse effect on the reading achievement of this group.

TABLE XIV
COMPARISON OF THE READING ACHIEVEMENT OF 61 CONDITIONED STUDENTS
WITHOUT A RADIO PROGRAM AND WITH A MUSCAL RADIO PROGRAM

Form	Mean	Standard Error of the Difference Between Means	Critical Ratio
Am (no radio program)	147.56	1.25	1.3
Cm (musical program)	145.92		
Diff.	1.64		

Table XV shows that the difference between the means on the reading test administered without a radio program and with a variety radio program for those who indicated they were not conditioned was .67 in favor of the test administered with a variety radio program. The ratio of the mean differ-

ence to its standard error was .37 which is statistically insignificant. This would indicate that the reading achievement of this group was not affected by the variety radio program.

TABLE XV

COMPARISON OF THE READING ACHIEVEMENT OF 30 UNCONDITIONED SIXTH GRADE STUDENTS WITHOUT A RADIO PROGRAM AND WITH A VARIETY RADIO PROGRAM

Form	Mean	Standard Error of the Difference Between Means	Critical Ratio
Am (no radio program)-----	146.43	1.79	.37
Bm (variety program)-----	147.10		
Diff.-----	.67		

Table XVI shows that the difference between the means on the reading test administered without a radio program and with a musical radio program for those who indicated they were not conditioned was 3.37 in favor of the test administered with a musical radio program. The ratio of the mean difference to its standard error was 1.8. This is an appreciable difference, but does not quite reach the conventional level for statistical significance. Nevertheless, so great a difference would be gotten by chance only about three and a half times in one hundred. This would indicate that the reading achievement was somewhat greater on the test administered with a musical radio program.

TABLE XVI

COMPARISON OF THE READING ACHIEVEMENT OF 30 UNCONDITIONED SIXTH GRADE STUDENTS WITHOUT A RADIO PROGRAM AND WITH A MUSICAL RADIO PROGRAM

Form	Mean	Standard Error of the Difference Between Means	Critical Ratio
Am (no radio program)-----	146.43	1.83	1.8
Cm (musical program)-----	149.43		
Diff.-----	3.37		

CONCLUSIONS

In view of the foregoing findings, the following conclusions would seem to be justifiable:

1. The reading achievement of the whole group was adversely affected by the variety radio program, but was not affected adversely by the musical radio program.

2. The reading achievement of both girls and boys was affected adversely by the variety radio program. Boys were affected slightly more than girls. The reading achievement of both girls and boys was not affected by the musical radio program. The reading achievement of the boys was slightly greater with the musical radio program.

3. The reading achievement of those with I. Q.'s above 100 was not affected adversely by the variety radio program. This group made a significant gain in reading achievement during the musical radio program. The reading achievement of those with I. Q.'s between 90 and 100 was affected adversely by the variety radio program, but was only slightly affected adversely by the musical radio program. The reading achievement of those with I. Q.'s below 90 was affected adversely by the radio variety program, but was not affected adversely by the musical radio program.

4. The reading achievement of those who were more or less conditioned was affected not less, but rather more adversely by the variety radio program and the same is true of the achievement during the musical radio program although to a lesser degree. The reading achievement of those who were not conditioned was slightly better during the variety radio program, although the difference was not statistically significant. The reading achievement of this group was somewhat greater during the musical radio program, but this difference was also not statistically significant.