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# The Achievement of Bus Transported Pupils

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## Introduction

Busing pupils is an educational means and never an end in itself, and the over riding purpose of transporting students in school buses is to provide them educational opportunities that otherwise might be denied. The educational opportunity may be academic, economic, or social, each with various degrees of overtness or subtlety.

The busing question usually centers into two population centers, one involves populated urban and suburban schools and the other sparse rural regions. This article addresses itself to the latter group. Sparsely populated regions very often have open ended school enrollments. Upper limits are determined by how far the bus routes can reasonably extend into the surrounding countryside. When busing is discussed educators and patrons alike often ask the following question: "Do advantages in better learning through consolidation outweigh the disadvantages of time spent on buses?"

Rural school patrons usually have a choice of accepting either limited consolidation with shorter bus routes and a smaller school, or more extensive consolidation of schools with longer bus routes. The authors, in carrying out the research described in this article, sought to provide some insight into the issues.

## Selection of Pupils

In the state of Montana 171 high schools are in operation. Forty of these schools were randomly selected to determine if bus riding time and school

size either together or separately influenced the achievement of transported high school students.

Data from 812 randomly selected pupils who attended the forty schools were analyzed in regard to the size of school they attended and the amount of time they spent riding the bus to school. The schools were in three categories: Small (1 to 99 students), Medium (100 to 499 students), and Large (500 students and over). The amount of time spent riding the bus one way was categorized as follows: 1 through 30 minutes, 31 through 45 minutes, 46 through 60 minutes and 61 or more minutes. Table 1 shows the breakdown of students in each category.

TABLE 1  
SUMMARY OF FREQUENCIES IN FACTOR-LEVEL  
COMBINATIONS, RIDING TIME AND SCHOOL  
SIZE TOTALS

| School<br>size<br>levels | Riding time levels |       |       |             | Size<br>level<br>totals |
|--------------------------|--------------------|-------|-------|-------------|-------------------------|
|                          | 1-30               | 31-45 | 46-60 | 61-<br>over |                         |
| Small                    | 78                 | 55    | 53    | 68          | 254                     |
| Medium                   | 93                 | 78    | 55    | 65          | 291                     |
| Large                    | 68                 | 63    | 76    | 61          | 267                     |
| Riding<br>time<br>totals | 239                | 296   | 184   | 193         | 812                     |

## Results

### Grade Point Averages

Applying analysis of variance techniques to nine components of earned school grades revealed that:

1. Significance testing of ninth grade through twelfth grade students' Grade Point Averages showed

no evidence of riding time-school interaction. There was also no evidence of effects due to riding time alone or to school size alone for grades 9 through 11.

2. In viewing twelfth year students' Grade Point Averages significant differences were observed among the averages of the three school sizes. Transported pupils attending medium sized high schools received significantly higher marks than did bus pupils from either small or large high schools. Transported students from large schools received significantly higher school grades than did pupils in small schools.

3. The achievement as compiled by school grades in required courses taken by students during the ninth through twelfth years showed no evidence of effects due to riding time, school size, or interaction of the two factors.

4. There was no evidence of interaction effects or riding time effects on the school grades received for elective courses taken in high school. Bus students attending small high schools received significantly lower elective course marks than those attending medium or large schools. Pupils from medium schools earned significantly higher G.P.A.'s for elective subjects than did students from large high schools.

Non-significant mean differences tend to show highest achievement for bus pupils riding for 61 or more minutes, up to an observed maximum riding time of 90 minutes. This tendency occurred in about two-thirds of the earned school grade components. Students riding buses from 31 to 45 minutes tend to achieve lower school grades than pupils from the shorter or two longer riding time categories. School size means tend to favor the 100-499 enrollment high schools in all of the nine G.P.A. components, although significant differences appeared only during the senior year and for elective school subjects.

Standardized tests. Three standardized tests were selected for use in analysis of student achievement. Analysis of variance was applied to each of the three with the following results:

1. The American College Test (ACT) showed evidence of significant interaction. Lowest ACT scores were made by small school bus pupils riding for 31



minutes up to 90 minutes. Medium sized school bus students tended to score generally higher than students from small and large sized level schools, but the highest ACT scores were made by large sized school bus pupils in the 31-45 minute time level.

2. National Merit Scholarship Qualifying Test (NMSQT) administration is much more selective in large schools as compared to smaller schools. Small schools have a bus population that scores significantly lower on the NMSQT. The large schools score higher.

3. The Preliminary Scholastic Aptitude Test (PSAT) verbal test section showed significant differences in the achievement of bus pupils between large and small schools and between medium and large schools, favoring the large in both instances. There was no evidence of interaction or bus riding time effects.

Achievement on the PSAT mathematical section gave no indication of any interaction influence. Riding time effects and school size effects were also not evident.

Transported students attending large schools tend to receive higher scores on standardized tests than do bus pupils from smaller schools. Riding time interacted with school size on one test but with inconclusive results. The effects of bus riding up to 90 minutes have no differential influence on the standardized test achievements of transported pupils.

### Conclusions

The results of this study indicate that there are very few, if any, evidences of interaction between school bus riding time and school size. If pupils riding the bus for short periods of time achieve at a certain level, it is not the combination of the short ride and the size of enrollment functioning together that accounts for their achievement. Likewise, students riding the bus up to 90 minutes one way need not expect a certain level of achievement simply because they are long riders attending a certain sized school.

The first conclusion of this study therefore states: Specific combinations of school bus riding time and school size do not exist that could account

for any given level of school grades or standardized test achievement within the transported Montana high school rural population.

The evidence is conclusive to show that school bus riding time up to 90 minutes does not significantly affect the achievement of the transported pupil as measured by earned marks and standardized test scores. For any given school size, high school students transported for intervals of 0-30 minutes, 31-45 minutes, 46-60 minutes, and 61 or more minutes up to 90, will not experience true differences in academic achievement. The second conclusion of this study therefore states: Within any one of the three sizes of Montana high schools, transported rural pupils riding the bus for up to 90 minutes one way will not experience any significant given level of school grades and standardized test achievement that can be attributed to the bus ride itself.

The size of school attended does explain some of the achievement variation found within the transported population. Those bus students attending medium sized Montana high schools attain higher marks during the senior year and in elective subjects than do pupils attending either small or large high schools. Large size pupils who are bused to school earn higher marks in the twelfth grade and in elective subjects than do bus pupils from small sized high schools. Achievement during the first three years of high school and in required courses is nearly equal regardless of school size, although there is a tendency to receive higher grades in medium sized schools. A third conclusion of this study therefore states: Any given level of earned school grade achievement experienced by transported Montana high school rural pupils during the first three years of school, or experienced within required school courses, cannot be attributed to the size of high school attended; twelfth grade and elective course earned mark achievement can be attributed to school size and favors the medium sized high school.

The achievement of transported pupils on standardized tests is generally higher in large high schools, under the conditions of increasing electivity practiced by Montana high schools as they become larger. The PSAT is the most commonly administered standardized

test taken by transported Montana high school students. Verbal performance favors the student in the large school. A fourth conclusion of this study therefore states: Any given level of PSAT verbal achievement or NMSQT achievement experienced by transported Montana high school rural pupils can be attributed to the size of school attended; those attributes measured by standardized tests are most apt to be found in transported pupils attending large high schools.

Overall it would therefore seem that the time spent on buses does not have a negative effect on student learning; however, the size of the school attended does seem to have an effect.