The effects upon the academic achievement of elementary school students transferred due to school closure
by Deborah Ann Jacobsen

A thesis submitted in partial fulfillment of the requirements for the degree of Doctor of Education
Montana State University
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Abstract:
This study investigated the impact on the academic achievement of transferring elementary students
due to closing public elementary schools of students in selected Montana schools. Due to declining
enrollment and subsequent decrease in state education funding, several Montana school districts have
either closed or are exploring the closure of schools. This study involved second, third and fourth grade
students in Helena and Bozeman, Montana school districts. These two districts closed schools in the
spring of 1998.

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Comprehensive Test of Basic Skills 4th and 5™ editions. In addition, student data at the three grade
test scores included gender, and academic aptitude as measured by the Test of Cognitive Skills. The
sampling design of matched pairs was used to exercise some control over the extraneous variables of
gender and aptitude. Data was analyzed using a two-way analysis of variance.

Statistical analysis indicated there was no statistically significant difference (at the .05 level) of the
academic achievement between transferred students and non-transferred students in reading, language
and mathematics sub-tests of the Comprehensive Test of Basic Skills. It was concluded that school
closure did not have an impact on the academic achievement of selected Montana elementary students
forced to change schools due to school closure.
THE EFFECTS UPON THE ACADEMIC ACHIEVEMENT OF ELEMENTARY SCHOOL STUDENTS TRANSFERRED DUE TO SCHOOL CLOSURE

by

Deborah Ann Jacobsen

A thesis submitted in partial fulfillment of the requirements for the degree of

Doctor of Education

MONTANA STATE UNIVERSITY - BOZEMAN
Bozeman, Montana

March, 2000
APPROVAL

of a thesis submitted by

Deborah Ann Jacobsen

This thesis has been read by each member of the graduate committee and has been found to be satisfactory regarding content, English usage, format, citations, bibliographic style, and consistency, and is ready for submission to the College of Graduate Studies.

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Chairperson, Graduate Committee

Approved for the Major Department

April 10, 2000
Date

Dr. Gloria Gregg
Department of Education

Approved for the College of Graduate Studies

4-13-00
Date

Dr. Bruce McLeod
Dean, Graduate School
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Date  April 5, 2000
ACKNOWLEDGEMENTS

A debt of gratitude is owed to many people who guided, influenced, supported and assisted the author in this research. Included are:

- Dr. Duane Melling, committee chair, and Dr. Dale Olson, committee member, whose patience, information, questions and guidance were greatly appreciated throughout the course of this study and doctoral program;
- Drs. James Doyle, Jana Noel, Joanne Erickson and Nancy Dodd, doctoral committee members, whose time and advice helped bring this study and doctoral program to a satisfactory conclusion;
- Fellow members of MSU Cohort I for their support and camaraderie during the last 5 years;
- Helena Superintendent Dr. Bruce Messinger and Bozeman Superintendent Dr. Michael Redburn, for their permission to use district data in this study;
- Mr. Keith Meyer, Helena Director of Elementary Schools, whose ongoing support extended to providing encouragement and professional time to pursue this study and doctoral degree;
- Mrs. Terry Baldus, Bozeman Director of Curriculum, and her staff, who provided data and details from the Bozeman Schools;
- Helena District administrative and teaching colleagues for their support, encouragement and professional assistance; and
- My family and friends, whose encouragement and cheerleading provided the frequent and necessary boosts of energy needed for perseverance. Cheers!
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<td>Third Grade – tests of between subjects effects, dependent variable: total math CTBS</td>
<td>62</td>
</tr>
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<td>8</td>
<td>Third Grade – tests of between subjects effects, dependent variable: total reading CTBS</td>
<td>62</td>
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<td>Helena Fourth Grade – tests of between subjects effects, dependent variable: total math CTBS</td>
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ABSTRACT

This study investigated the impact on the academic achievement of transferring elementary students due to closing public elementary schools of students in selected Montana schools. Due to declining enrollment and subsequent decrease in state education funding, several Montana school districts have either closed or are exploring the closure of schools. This study involved second, third and fourth grade students in Helena and Bozeman, Montana school districts. These two districts closed schools in the spring of 1998.

Data was gathered from student test scores in reading, language and mathematics on the Comprehensive Test of Basic Skills 4th and 5th editions. In addition, student data at the three grade levels included gender, and academic aptitude as measured by the Test of Cognitive Skills. The sampling design of matched pairs was used to exercise some control over the extraneous variables of gender and aptitude. Data was analyzed using a two-way analysis of variance.

Statistical analysis indicated there was no statistically significant difference (at the .05 level) of the academic achievement between transferred students and non-transferred students in reading, language and mathematics sub-tests of the Comprehensive Test of Basic Skills. It was concluded that school closure did not have an impact on the academic achievement of selected Montana elementary students forced to change schools due to school closure.
CHAPTER 1

INTRODUCTION

The 'boom' and the 'echo' have been felt across the nation, and have impacted many aspects of American life. The population burst at the end of World War II, called the baby boom, became a driving force behind rapid growth in many industries and institutions in the United States. Housing and communities were redefined with the building of Levittown on Long Island in New York, and industry and manufacturing scrambled to fill the needs of these growing families. Education too, was forced to grow and expand to accommodate the many new children entering the system. New schools were built and teachers hired to educate what was to become known as the 'baby boomers'.

These 'boomers' passed through our educational system, married and had their own families. These children of the 'boomers', sometimes called the 'echo', have also impacted the systems in our nation. This cycling through of generations has caused great fluctuations in the school enrollment over the decades since the war. When the 'boomers' began exiting the educational system, the first wave of declining enrollment issues surfaced. According to the U.S. Department of Education, National Center of Education Statistics, there was “...declining total enrollment in elementary and secondary schools during the 1970's and early 1980's (from 51.3 million in 1971 to 44.9 million in 1984)”
(National Center for Educational Statistics, 1999, p. 98). Then the ‘echo’ generation entered school and “total elementary and secondary school enrollment increased considerably during the late 1980’s and 1990’s, reaching an all-time high of 52.7 million in 1998” (National Center for Educational Statistics, 1999, p. 98).

#### Elementary and secondary school enrollment (in thousands), by control and grade level of school, with projections: Fall 1970-2008

<table>
<thead>
<tr>
<th>Year/Period</th>
<th>PreK-12</th>
<th>PreK-8</th>
<th>9-12</th>
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<tbody>
<tr>
<td>1970</td>
<td>45,894</td>
<td>32,558</td>
<td>13,336</td>
</tr>
<tr>
<td>1988</td>
<td>40,189</td>
<td>28,501</td>
<td>11,687</td>
</tr>
<tr>
<td>1998</td>
<td>46,792</td>
<td>35,522</td>
<td>13,270</td>
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<tr>
<td>2008</td>
<td>48,201</td>
<td>33,455</td>
<td>14,746</td>
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</table>

**Projected**

<table>
<thead>
<tr>
<th>Year/Period</th>
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<th>PreK-8</th>
<th>9-12</th>
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<tr>
<td>2008</td>
<td>48,201</td>
<td>33,455</td>
<td>14,746</td>
</tr>
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</table>

**Percentage change**

<table>
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<th>PreK-12</th>
<th>PreK-8</th>
<th>9-12</th>
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<tbody>
<tr>
<td>1970-88</td>
<td>-12.4</td>
<td>-12.5</td>
<td>-12.4</td>
</tr>
<tr>
<td>1988-98</td>
<td>16.4</td>
<td>17.6</td>
<td>13.5</td>
</tr>
<tr>
<td>1998-2008</td>
<td>3.0</td>
<td>-0.2</td>
<td>11.1</td>
</tr>
</tbody>
</table>

2Enrollment includes students in kindergarten through grade 12 and some nursery school students.

NOTE: Details may not add totals due to rounding.


#### Public elementary and secondary school enrollment (in thousands), by region, with projections: Fall 1980-2008

<table>
<thead>
<tr>
<th>Fall of year</th>
<th>Northeast</th>
<th>Midwest</th>
<th>South</th>
<th>West</th>
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</thead>
<tbody>
<tr>
<td>1980</td>
<td>8,215</td>
<td>10,698</td>
<td>14,134</td>
<td>7,831</td>
</tr>
<tr>
<td>1988</td>
<td>7,208</td>
<td>9,846</td>
<td>14,491</td>
<td>8,644</td>
</tr>
<tr>
<td>1990</td>
<td>7,282</td>
<td>9,944</td>
<td>14,807</td>
<td>9,184</td>
</tr>
<tr>
<td>1995</td>
<td>7,894</td>
<td>10,512</td>
<td>16,118</td>
<td>10,316</td>
</tr>
<tr>
<td>1998*</td>
<td>8,215</td>
<td>10,680</td>
<td>16,864</td>
<td>11,033</td>
</tr>
<tr>
<td>2008*</td>
<td>8,100</td>
<td>10,344</td>
<td>17,501</td>
<td>12,257</td>
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</table>

**Projected percentage change**

<table>
<thead>
<tr>
<th>Year/Period</th>
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<th>Midwest</th>
<th>South</th>
<th>West</th>
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<tr>
<td>1988-98</td>
<td>14.0</td>
<td>8.5</td>
<td>16.4</td>
<td>27.6</td>
</tr>
<tr>
<td>1998-2008</td>
<td>-1.4</td>
<td>-3.1</td>
<td>3.8</td>
<td>11.1</td>
</tr>
</tbody>
</table>

*Projected enrollment. Enrollment includes students in kindergarten through grade 12 and some nursery school students.


Figure 1: Elementary and Secondary School Enrollment by Control and Grade Level of School, with Projections: Fall 1970-2008

The cycling continues and some communities are again faced with enrollment issues as the children of boomers exit the educational system. Between 1998 and 2008, the U.S. Department of Education is projecting only 3% growth in PreK-12 enrollment, compared to a 16.4% increase from 1988 to 1998. In addition, at the elementary level (preK-8) enrollment is expected to decrease by .2% from 1998 to 2008. (National Center for Educational Statistics, 1999, p. 98).

![Elementary and secondary school enrollment, by control and grade level of school: Fall 1970-2008](image)

Figure 2: Elementary and Secondary School Enrollment

David Foot, a professor of economics at the University of Toronto and a private consultant, addresses the concerns of school enrollment in Canada, which faces a similar cycling of populations. "The end of the millennium won't bring good news for 10 Toronto schools. They are slated to close by June, 2000, in the first phase of the new Toronto District School Board's three-year plan to
close as many as 30 schools” (Foot, 1999, p.1). He continues by addressing
demographics as the cause.

Yet to hear education officials talk, be they from governments,
school boards or teachers unions, you'd think the latest decline in
the number of students had come out of nowhere. They seem
strangely ignorant of the underlying, and entirely predictable,
cause: demographics. Back in the 1950's and 60's we educated
the baby boom. As the children made their way through the early
grades, then high school, then college...we expanded each system
to accommodate them. (Foot, 1999 p.2)

Coupled with the impact of enrollment fluctuations is the additional burden
of facility deterioration. Many of the schools built to accommodate the ‘boomers’
are 50 years old now and evidencing expensive need for renovation, upgrade or
demolition. Two years ago, the Washington D.C. school district was forced to
make difficult decisions due to declining enrollment and facilities needs.
Superintendent Becton, a retired military officer, recommended 16 schools be
closed. His choices, based on facility integrity and need, evoked much dialogue
within the community.

Mr. Becton argues that a school is just a building, and that
instruction can be improved by moving innovative educational
programs and good teachers to sounder structures...A few of the
16 schools targeted for closing are considered among the district's
best. Lewis Elementary is one-third empty and needs a new roof, but its third graders had the best standardized test scores in the
system last year. (Reinhard, 1997, p.2).

Public Education infrastructure has been the subject of congressional debate and
presidential initiative. Too few children in run-down schools is a public concern.

In addition to declining enrollment and facilities, educators in the last half
of this century also began to subscribe to the industrialists’ concept of doing
business. School closures and consolidations were seen as more cost-effective and would render better service to taxpayers.

The logic for consolidating schools springs from an idea born in the late 19th century industrial era: “Economy of scales” is the idea that you can reduce your production cost by increasing the size of the facility. Since that era, school systems have based their organizational structures on the belief that education can contribute to an optimal social order using techniques adapted from industry. (Fanning, 1995, p.1)

The concept of economy of scales was adopted by school districts nation-wide, and contributed to a dramatic reduction in the number of school districts during this century. “In 1931-32 there were 127,531 school districts in the United States...in 1987-88 there were 15,577 districts. The decades from 1940 to 1970 show the largest declines, most of which can be accounted for by the reorganization of small and rural school districts” (Lutz, 1990, p.2).

The combination of the factors of declining enrollment, facilities deterioration and economy of scales fueled school closures throughout the country. Districts were downsized or eliminated, buildings were closed and enrollments consolidated. This activity made the administration of public education more efficient and cost-effective, yet the question remained for many parents and educators – is this good for children?

**Statement of the Problem**

The problem of this study was to determine if there was a difference between the academic achievement of transferred students due to the closing of their elementary school and the academic achievement of students able to
remain in their home school. Included in this problem is the interaction between transfer status, socioeconomic status, and gender.

Need for the Study

During the last two decades, district administrators and local school boards have been faced with the difficult dilemma of exercising fiscal responsibility while maintaining small neighborhood schools without sacrificing educational quality. In response to this issue, many school districts across the country have chosen to close and consolidate schools in order to "run schools efficiently and meet national goals" (Fanning, 1995, p.1). The western region of the United States has faced this dilemma with the addition of increasing population. From 1988 to 1998, the western region of the United States had a 27.6% increase in public elementary and secondary school enrollment. From 1998 to 2008, school enrollment in the western region is projected to grow an additional 11.1%. (National Center for Educational Statistics, 1999, p. 98).

Montana has not been immune to population fluctuation and consolidation issues. But, because of its western location and appeal, Montana's educational enrollment has been slowly growing along with its population. According to the U.S. Census Bureau, in 1890 Montana's population was 243,329, in 1950 – 591,024; in 1970 - 694,409 and in 1990 the population was 799,065. (Montana Department of Commerce, 1999). Public school enrollment increased also, and Montana schools were not directly impacted by the baby boom exit in the 70's.
In spite of the western states’ trend of population growth and increasing school enrollment, Montana is now experiencing declining school enrollments. According to the statistician at the Montana Office of Public Instruction, “After climbing for more than five years, public school enrollment began to decline in 1996-97. The dropping enrollment is driven by falling enrollment in the early grades. The decline in elementary school enrollments began in 1994-95. High school enrollment has grown since 1990, but is projected to begin declining in 1999-2000” (Neilson, 1999, p. 8). The chart on page 8 shows the changes in enrollment in Montana public schools between 1988 and 1999.

As a result of the declining elementary enrollments in many areas of the state of Montana, and the resulting loss of state funding, several school districts have closed or are considering closing schools in the near future. In 1999, Missoula, Montana, School District voted to close three schools over the next three years, and this spring marked the closure of the first two. This closure sparked much community distress and a lawsuit. From the Missoulian Newspaper: "Roosevelt and Dickenson Schools are slated to close Friday (6-11-99) as K-5 school buildings." An attorney representing a community group “wrote that the decision to close the schools was ‘arbitrary and capricious, not supported by substantial evidence and clearly erroneous and void’ ” (Jahrig 1999 p.1).
At the end of the 1998 school year, Bozeman, Montana, School District closed the Willson Elementary School, due also to enrollment and budgetary issues. The Billings, Montana, School Board is considering the closure of Garfield Elementary School due to the age of the building and budget constraints. From the Billings Gazette: “A new plan to improve educational opportunities for South Side students involves closing Garfield Elementary and moving Garfield's students to an extensively remodeled Orchard Elementary” (Howard, 1999, p.1).

Brian Dunn, superintendent of Great Falls, Montana, Public Schools, indicated in October of 1999, that declining enrollment could cause the district to lose almost $700,000 in state money. He indicated if “enrollments continue to drop as
projected, the community will have to at least discuss in two years the closing of one or two elementary schools..." (Johnson, 1999, p.1).

The Helena, Montana, Public School district has also been facing declining enrollment at the K-5 level since 1993. In 1999, the district had a K-5 enrollment of 3158 students, down from 3776 in 1993. This decrease of 628 students is approximately 17% of the student K-5 population. The charts on page 10 are graphic representations of the decline of Helena elementary student population since 1993. During the same time, the enrollment at the middle school level has been increasing, from 1831 students in 1993 to 2087 students in 1997. This increase of 256 students partially offset the decline in the K-5 schools, and allowed the district to make less drastic cutbacks until 1997. However, beginning in the 98-99 school year, the middle school population began experiencing the declining enrollment moving up from the elementary grades.

The Helena, Montana, Elementary District was forced to make very difficult decisions in order to maintain quality education within the constraints imposed by the decreasing state funding as a result of declining enrollment. In April of 1998, the Helena Board of Trustees voted to close the district's two smallest schools. Reporter Mark Goldstein wrote in the *Helena Independent Record*, that "...the two schools will shut down after the current school year as part of the district's budget cuts, which were spurred by a decrease in elementary enrollment" (Goldstein, 4/24/98, p.1). Lincoln Elementary School, with an enrollment of approximately 80, and Ray Bjork Elementary School, with an
Student Enrollment K-5 1994-1999

<table>
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<tr>
<th>Year</th>
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<td>93-94</td>
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<tr>
<td>94-95</td>
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<tr>
<td>97-98</td>
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<tr>
<td>98-99</td>
<td>3158</td>
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Figure 4: Helena District K-5 Enrollment
Source: District Data Profile, 1999.

Student Enrollment 6-8 1994-1999

<table>
<thead>
<tr>
<th>Year</th>
<th>Enrollment</th>
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<td>93-94</td>
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<td>2018</td>
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<tr>
<td>97-98</td>
<td>1930</td>
</tr>
<tr>
<td>98-99</td>
<td>1935</td>
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Figure 5: Helena District 6-8 Enrollment
Source: District Data Profile, 1999.
enrollment of approximately 125, ceased operation as elementary schools on June 6, 1998. The closure of these two schools caused great distress within the Helena community. Board members came under fire from parents and some teachers for taking an action that could cause damage to children. Board member Mitchell indicated she felt "...that the consolidation to 10 elementary schools is unfortunate but necessary in order to preserve the quality of education that I would like to see provided to each student in the district" (Goldstein 4/24/98, p.1). A lawsuit was filed by parents of one of the students affected, and a preliminary injunction prohibiting the closure was also requested.

In the suit, the Butlers allege the school board and Messinger (district superintendent)...misapplied the law regarding school closure by determining that all students in the district are affected, rather than the students at the two schools to be closed. The suit also calls for a permanent injunction barring the board or Messinger from closing the two schools until the board has properly documented substantial credible evidence that it is in the best interests of the students of Ray Bjork, Lincoln, Jefferson and Bryant elementary schools. (Goldstein, 4/28/98, p.7A)

The injunction was denied by the court, and the lawsuit later settled out of court with the district agreeing to write a specific policy relating to closing schools. Lincoln and Ray Bjork schools remained closed, with the majority of displaced students attending the neighboring schools of Jefferson (from Ray Bjork) and Bryant (from Lincoln).

Informal interviews with receiving principals (K. Winslow, personal communication, December 13, 1999 and M. Fahrman, personal communication, November 19, 1999) and school board reports (Helena School Board, 1998) indicate that the transferred students did well in their new schools. Both Bryant
and Jefferson Schools made great efforts to welcome the new students. Each transferred child had a pen-pal at the new school, they went on a ‘field trip’ to visit their pen-pals at the school, the parent councils at Jefferson and Bryant sponsored a family barbecue for the transferred families, and the administrators visited the transferred students while they were still at Lincoln and Ray Bjork.

Research suggests that what happens in the classroom is still the ultimate measure of the effectiveness of school reform. (Lutz, 1990). When students are transferred to another school, an immediate concern is the quality of the teaching staff at the receiving school. According to Krausharr, who studied perceptions of staff when a residential school for the developmentally disabled closed in Fort Worth, Texas: “An assumption is present that movement of individuals and staff must lead to inferior services, due to direct knowledge. Caring staff tend to have a very territorial view of quality services; that no one else can do it as well...” (Kraushaar, 1995, p.2). This is part of the concern that has arisen in Montana districts that have closed or are considering closing schools.

Because the business of education is student learning, it is important to know if the closure of schools affects student achievement. Educational decision-makers need research-based data when analyzing actions and planning for the future. Parents and teachers need specific data relating to the educational progress of their children. It was the intent of this study to provide that data and information.
Definition of Terms

1. **School Closure**: The closing of a district’s school *due* to declining enrollment, facility decline or budgetary reasons; *not* due to district consolidation resulting in the elimination of a school district and the subsequent closure of schools.

2. **Transferred Students**: Those students who were transferred to a different school due to the closing of their home school. These students do not include those who changed schools due to transition to the next graded school organizational level (i.e.: fifth grade to middle or eighth grade to high school).

3. **Non-transferred Students**: Those students who remained in the same building they attended the previous year.


7. For the purposes of this study, **student achievement** is defined as student performance in the Reading, Mathematics and Language sub-tests of the Comprehensive Test of Basic Skills, 4th Edition (CTBS/4) and the Comprehensive Test of Basic Skills, 5th Edition (Terra Nova).

8. For the purposes of this study, **student ability** is defined as student

9. **FTE** is defined as full time equivalent, which is a term to identify the number of full time employees in a system. This term is used because some employees are working part time, with their hours added to the total as, for example, .5 FTE, meaning that person works half time.

10. **Mobility** is defined as student movement from school to school during their academic career.

11. **Socioeconomic status** is defined as whether or not a student participates in the federal free/reduced lunch program. This participation is considered evidence of approaching, being at or below the national poverty level.

**Questions to be Answered**

1. Was there an interaction among transfer status, socioeconomic status and gender on the academic achievement of second graders?
2. Was there an interaction between transfer status and socioeconomic status on the academic achievement of second graders?
3. Was there an interaction between transfer status and gender on the academic achievement of second graders?
4. Was there an interaction between socioeconomic status and gender on the academic achievement of second graders?
5. Was there a statistically significant difference between the academic achievement of transferred second graders and non-transferred second graders?
6. Was there a statistically significant difference between the academic achievement of second grade students living in families of low
socioeconomic status and second grade students living in families of high socioeconomic status?

7. Was there a statistically significant difference between the academic achievement of second grade female students and second grade male students?

8. Was there an interaction among transfer status, socioeconomic status and gender on the academic achievement of third graders?

9. Was there an interaction between transfer status and socioeconomic status on the academic achievement of third graders?

10. Was there an interaction between transfer status and gender on the academic achievement of third graders?

11. Was there an interaction between socioeconomic status and gender on the academic achievement of third graders?

12. Was there a statistically significant difference between the academic achievement of transferred third graders and non-transferred third graders?

13. Was there a statistically significant difference between the academic achievement of third grade students living in families of low socioeconomic status and third grade students living in families of high socioeconomic status?

14. Was there a statistically significant difference between the academic achievement of third grade female students and third grade male students?

15. Was there an interaction among transfer status, socioeconomic status and gender on the academic achievement of fourth graders?

16. Was there an interaction between transfer status and socioeconomic
status on the academic achievement of fourth graders?

17. Was there an interaction between transfer status and gender on the academic achievement of fourth graders?

18. Was there an interaction between socioeconomic status and gender on the academic achievement of fourth graders?

19. Was there a statistically significant difference between the academic achievement of transferred fourth graders and non-transferred fourth graders?

20. Was there a statistically significant difference between the academic achievement of fourth grade students living in families of low socioeconomic status and fourth grade students living in families of high socioeconomic status?

21. Was there a statistically significant difference between the academic achievement of fourth grade female students and fourth grade male students?

Review of Literature

As background for this study, two major areas of literature relating to school closures were reviewed. The first section examines the process and rationale used when districts faced declining enrollment and school closures. The second section investigates literature relating to the impact school closures have on student academic achievement.
Rationale and Process for Determining to Close Schools

"The school closure decision is one of the most difficult decisions a school board can make. Both economic and non-economic factors must be considered..." (Allen, 1984, p.16).

This decision-making process is under close scrutiny not only by school boards and district administrators, but by the public, parents, taxpayers, attorneys and legislators. Richard Weatherly discussed the school closings in Seattle, Washington in 1981. Due to a 50% decline in enrollment since 1962, the district was preparing to close 18 of 112 schools. Surrounding the discussion of school closure were such issues as "property management, desegregation/integration, relocation of students, long range planning, teacher negotiations, special interest groups, and legal issues" (Weatherly, 1983, p.15). These and other factors must be carefully considered when deliberating the impact of closing schools. From a practical standpoint, districts do not usually consider closing schools unless forced by circumstances of declining enrollment, facilities deterioration or fiscal constraints. Consequently, the most common school closure deliberations revolve around the above issues rather than academic quality and student achievement. However, one can argue that, without making the changes necessitated by low enrollment, poor buildings and lack of funding; academic quality and student achievement would suffer due to possible program and staffing cuts resulting in increased class size and decreased services. Therefore, when listening to and reading about school board rationale and
processes for school closure, this researcher assumes the best interests of children are at the core of any discussion.

Loss of state funding due to declining enrollment and taxpayer non-support are two reasons that districts are forced to make budget cutbacks and consider closing schools. While school closures occurred more often in the 1970’s and 1980’s, there exist still areas of the country in distress. Several years ago, the Lubbock, Texas, school district was forced to consider school closures.

The resounding defeat of the county’s tax initiative earlier this month prompted renewed discussion among Lubbock school trustees Thursday on the need to cut costs by closing schools...Schools with smaller numbers of students tend to have the highest per-pupil costs because building maintenance expenses are the same as for schools with larger enrollments. (Thomas ,1997)

The taxation increases and the industrial concept of 'economy of scale' often cause a voting community to force change on their local educational system. Simple demographics, economics, employment variations and population mobility can also impact school districts. In Clancy, Montana, a new building was constructed anticipating continued community growth. However, the decline in the mining industry has affected the growth predictions.

In 1991, Clancy voters approved a $3.4 million school bond, allowing the school district to prepare for the next 20 years of projected enrollment growth. But less than seven years later, the district is facing the opposite problem: fewer than 375 K-8 students in a building designed for 600 and a continued enrollment decline projected for next year. (Goldstein 4/18/98, p. 1A)

When the financial concerns become a reality for a district, a logical planning process is undertaken to implement the cost-cutting measures. This process
often includes the establishment of specific criteria required before school closure is considered. Paul Shelley, writing for the National School Boards Association, states: “Here are the criteria...that should trigger a school closing: when enrollment drops below 200 pupils, when a school has only one class per grade level, and when the students of two neighboring schools can fit into one building...The result would be a single, consolidated school serving an expanded neighborhood” (Shelley, 1983, p.46). Agreeing with this criteria and citing several benefits to consolidating two school populations into one building, the report from the Eugene, Oregon school closure task force stated:

Consolidation of small elementary schools into schools with a minimum of a 250 student enrollment enhances the equality of educational opportunity for all students. Such schools have two to three classes per grade and sufficient specialists to help teachers with curriculum requirements. The increase in the number of classrooms at a given grade level provides for flexibility in placement of students and the choice of teachers. Elementary schools with a minimum of 250 enrollment generally have a wider selection of textbooks, reference books, library books, AV materials and equipment, and special equipment such as calculators, computers and video equipment. (Brott, 1981, p! 19)

But school closure criteria is often more complex than Shelley and Brott indicate. Districts must consider the viability of the facilities, transportation, pupil safety, and the social and political ramifications of closing a given school. Allen (1984) suggests that districts must also consider varied ways of forecasting enrollments for comparison, physical structure of the buildings, geographic location, maintenance needs, facilitating community input and long range planning.

The passage of time since the initial wave of closures has brought additional or expanded issues when considering school closure. The Americans
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with Disabilities Act requires handicapped accessibility for students, staff, parents and community members. Board members and administrators must evaluate each building for compliance and factor in additional costs for upgrades to the receiving facility if necessary. Other areas requiring careful inspection are:

- Asbestos abatement
- Fire code compliance – adequate escape routes, proper doors and closures, sprinkler systems, etc.
- Food service capabilities
- Title IX compliance – does the receiving school have adequate facilities for increased athletic activities for both males and females.
- Traffic study and impact of increasing private vehicles and possibly district transportation vehicles.
- Parking – adequate amount and safe ingress and egress.
- Playground area and equipment – can the receiving school safely accommodate more students on the playground.
- Student safety – is the building able to be secured in the event of violence within or in the vicinity.
- Student access - are there safe walking routes for the children, controlled with lights, stop signs or paid crossing guards.

Weighing and measuring these and other concrete issues are factors for any district considering the closure of schools, for if the district fails to address these issues, it is assured that the parents, attorneys, media and community will bring them to the forefront.
School boards and administrators have also addressed the social and political components surrounding school closure. During the debates surrounding the closing of Dickenson School in Missoula, Montana in the spring of 1999, the needs of special populations were discussed. Dickenson served a large community of Hmong immigrant families from Laos who expressed concern for their children’s education in a new school whose staff and community were not familiar with the culture, language issues and history of the Hmong. (Jahrig, 1999, p. 2). There was concern about bilingual programs and student acceptance of minority children in the new school. And, in some communities, desegregation/integration is an important consideration. If a school system is under court order to desegregate, the closure of a building cannot impact the integration process. Even if the court is not involved, districts must carefully consider any racial implications of a decision to close schools.

In spite of best efforts, school closures often become political issues with pressures and manipulations possible. Thomas M. Donald, superintendent in Salt Lake City, warned of these potentials.

The possibilities for political influence and subtle pressures exist in every potential decision. When related to school closure one must always be alert to such conditions...Questions of justice, fairness and equity must be discussed often and openly. Whether a school is attended by rich children or poor children is not the issue...It requires a balance between cold logic and human emotions. (Donald, 1980, p.25)

Because wealthy parents are often more active in their child’s education (Eagle, 1989 and Bracey, 1996) more vocal, more able to apply financial and political pressure, there is danger that this school community could expect and receive
special treatment. The Helena, Montana, District had to face this issue when considering closing schools last year. Ray Bjork School is in an affluent part of town, and Lincoln school serves a poor community. The parents of Ray Bjork students were very vocal and active in their opposition to the closure of their school, while few Lincoln parents expressed concern. While it would have been easiest for the school board to take the path of least resistance, it would not have been equitable, fair or just. As a newspaper editorial in Washington, D.C. recently expressed: “In the name of economy and convenience, officials in the nation’s capital have just closed one of the city’s few decent schools, rewarding instead two of its worst. Misinformation, misplaced values, and just plain stupidity lie behind a shortsighted and counterproductive decision” (Merrow 1997, p.1).

The issues of school closure, facility viability, special needs populations, social and political implications and pressures are all wrapped within the packages of human beings, who, by our ‘feeling’ nature, place additional burdens on the decision-making process. Robert Paolicchi, in his study of school closure, indicates that “closing a school is not just an economic issue, it is an emotional issue (which)...cannot be approached as purely financial or facilities problem; administrators must be sensitive to people’s concerns” (Paolicchi, 1982, p. 9). Parents have investments of volunteer time, personal history and fundraising efforts in their local schools. These personal investments make any discussion more painful for them. Parents are also concerned with their children’s safety
and educational quality. However, David Foot adds another possible parent perspective.

Mothers and fathers are saying they don’t want their local schools closed and their children faced with crowding or with long walks or bus rides...While their concern is understandable, and may reflect genuine need, it also reflects the perceived impact of school closings on the community and, often, on property values. (Foot, 1999 p.3)

Working with parents and community members with the closure of a school is similar to working with someone grieving a death. A superintendent in Oklahoma explains this by stating:

Public reaction to the announced closing of a school may be compared to the stages a patient goes through when told he has a terminal illness. First there is denial...then comes anger...next is the bargaining stage...this is followed by depression...then comes acceptance. In the process of closing a school, some administrators may be tempted to concede to one of the earlier phases of public reaction. But if you persist, you'll reach the point of the public's acceptance by all but a very few. (Brodinsky, 1981, p.6)

The predominantly expressed emotions are often rooted in fear. Parents are afraid their children will be injured, upset or less educated; staff members are afraid of losing their job, or if tenured, of facing new working conditions; community members are afraid of neighborhood impact; and administrators and board members are afraid of being the ‘bad guy’ and possibly making a mistake. Fear and distress permeates the school closure process, and compassionately addressing these emotions is the challenge for every person involved.

Those who have been through the process express the importance of communicating to concerned parties that education will be improved for students
as a result of the closure. Thomas Donald, superintendent of Salt Lake City, Utah, schools explains that, “When closing schools, the welfare of children is the most important concern of parents. Improving the quality of education is the most powerful way of obtaining public support for closing schools” (Donald, 1980, p. 24). If parents and community members understand and believe that the district is committed to maintaining a good educational system, and providing improved educational opportunities for children, their resistance to the closure lessens. Paul Shelly from NSBA, concurred with this.

Parents who initially were reluctant to support the closings later approved of them when they realized their children were in a school with a strong educational program, a more diversified staff, and good support services. The key...is getting parents to think about what their children gain in the new school rather than dwelling on the financial merits of the school being closed. (Shelly, 1983, p. 48).

As stated above, the public must feel confident in the educational quality provided, rather than feel impressed with the financial savings promised. In some instances, the promise of savings did not materialize. “School systems who had experienced school closures or consolidation were asked if they had saved money from closure. Fifty percent of the respondents said there was no savings, 16.7% indicated that there were increased costs, while 33.3% indicated that savings did accrue” (Marshall, 1988, p. 5). Howley studied school closures in West Virginia during the last two decades, when 25% of the state’s public schools were closed to encourage school improvement. He suggests “that the closures were a bad idea that served corporate interests rather than the public interests” (Howley, 1996, p.948).
School Boards and administrators must be clear and honest with themselves and the public about the reasons for school closure, or the process will be agonizing and counter-productive to the system and the children it serves. As Donald concludes; "The basic reason for closing schools is to improve the quality of education. There is no purpose in consolidation if it does not provide better education...The money formerly used for the operation of a school must be reallocated for direct services to students" (Donald, 1980, p. 24). In order to be ultimately accepted and found to be successful, the results of school closure must be perceived to do no harm, and to hopefully benefit the educational opportunities and services offered to children. This is a heavy burden placed on districts. "It is a responsibility pressed upon the school administration by demographics and decline. It carries with it the hope that educational opportunities can be improved in the midst of conflict, confrontation and consolidation" (Donald, 1980, p. 21).

This section of the literature review examined the rationale and processes involved in closing schools. Further review is now undertaken to provide research and information on the effect school closure has on the academic achievement of students. The next section of this review will assist to inform this writer of research in the field, and provide a context within which her study will occur.
The Impact of School Closing on Student Achievement

"My children going to a new school are not going to get the attention they need, not get their work done, not learn their work and do it right, how will they become good citizens. Do you want your kids to be dummies? I don't" (Brott, 1981, p. 87). This sentiment, voiced by a parent in Eugene, Oregon during a school closure public hearing, clearly expresses a primary concern when moving students due to school closures. Will the students' academic achievement be affected by this action? The number of school closures in the 1970's and 80's generated the need and opportunity for research on many aspects of school closure and its impact. Several studies were conducted relating specifically to student achievement. While none of the studies dealt with Montana children, the existing research can provide a framework of understanding for this study.

Many studies exist that explore the effect of student mobility on achievement. Prior to the school closures in the 1970's and 1980's, researchers studying the impact of these closures were forced to look at information on general student mobility because no research was available on student movement due to school closure. Information on general student mobility provided a basis for further investigation. "Research has demonstrated that students who frequently change schools are more likely to experience academic, social and emotional problems than students who do not change as often" (Nelson, 1996, p. 365). According to the United States Census Bureau, approximately 20% of the population moves each year. Thousands of children change schools when families move. The frequency of moves has an impact on
the children's educational experiences. Karl Alexander tracked movement of children in Baltimore, Maryland during the first five years of their elementary career. The majority of students in his sample were minority and low income children because "there was an outflow of advantaged and white students from the system, but that minority children and those who are poorest move most often within the city system" (Alexander, 1996, p.9). Alexander concluded from his investigation "that school transfers are commonplace and complexly patterned for children in Baltimore's public schools. It also leaves us with the impression that changing schools complicates school adjustment and slows academic progress" (Alexander, 1996, p. 10). Several other recent studies indicate similar findings of the impact of student mobility on student achievement. In her study of Chicago, Illinois, fourth graders, Mary Hefner found that students who transferred more than twice during their school career had lower reading achievement scores than those students who did not transfer. (Hefner, 1994). A Texas study in 1997 indicated that students who moved more often scored lower on state required tests. (Mao, 1997). Delores Evans found that mobility's impact on academic achievement was more profound when the children are from poor, less educated families. (Evans, 1996).

Due to the lack of research studies on school closures prior to the 1970's, Robert Paolicchi reviewed student mobility and school transfer research to provide a framework for his dissertation on school closure and student achievement. Much of his data related to junior college students moving into a four-year university system, although he did also cite studies involving younger
students moved as a result of court-ordered desegregation. His review of the existing literature on transfer and mobility generally indicated:

...that achievement is sensitive to transfer. However, each group of studies offers unique attendant variables, which may skew or accentuate the actual effect of transfer on student achievement. Junior College students, for example, often change institutions to complete their education. These transferees often need to reestablish a new circle of acquaintances and need to be totally oriented to the ways of the four-year university. Lower ability black youngsters may receive a richer curriculum and much special attention upon transfer to a white middle-class school...Bright children of mobile families appear to find these experiences challenging, while less able perceive such factors as frustrating and appear to achieve less. (Paolicchi, 1982, p. 32)

When children change schools because of a family move, there are many other variables that operate on the potential for student success. Moving includes leaving one’s home, neighborhood, friends, perhaps extended family and many things familiar and comfortable. The new school is frequently in another district and may have a different curriculum, student services, staff techniques and procedures. Paolicchi suggests that studying school closure’s effect on student achievement would allow one to reduce the impact of the other peripheral variables mentioned above. (Paolicchi, 1982, p. 3)

Glenn Latham studied the impact of the closure of the Inter-Tribal residential school in Utah in 1984. This Bureau of Indian Affairs school served at-risk Indian adolescents who had been referred to the school because the students were ‘difficult to serve’. They required intervention with academics, social and emotional distress, substance abuse and legal issues. In following the displaced students for two years, Latham found the following:
The data from this survey fail to support program related decisions, which were used to justify the closure of IIS (Intermountain, Intertribal school). In the minds of the agency personnel who oversee the placement of Indian students in off-reservation boarding schools, the overwhelming sense is that...students are worse off because of the closure of the school. Furthermore, there appears to have been no substantive effort on the part of the Bureau of Indian Affairs to up-grade the quality of the facilities and services of the remaining schools to accommodate the special needs of at-risk Indian students who elect to attend boarding schools off the reservation. (Latham, 1986, p. 20)

The inability to separate the effects of the other variables in the lives of these students makes it impossible to directly assess the academic impact of the school closure.

Another area of literature exists concerning the benefits of small schools versus large schools. It is assumed that, often, schools closed are those with a smaller enrollment than other schools in the district or area. Studies have been conducted to determine if academic achievement suffered when students moved to larger schools as a result of enrollment consolidation. The Manitoba, Canada, Department of Education investigated the possible closure of the small Falcon Beach Island School in 1987. In their study of existing research for their region, the study team found that: “a number of studies (Saskatchewan Education, 1981) have indicated that rural students score significantly higher on standardized basic skill tests than urban students” (Manitoba Dept. of Education, 1987, p. 20). Brock Rideout investigated school size and achievement literature for the Ontario, Toronto school system’s commission on declining enrollment. He found information to support the educational benefits both large and small schools.
Some studies show that students in very small schools perform less well academically than do those in larger schools. Other researchers have found that size of school makes little difference. Indeed, when other variables such as father's occupation, family attitudes, and socioeconomic index are introduced, students from small schools often out-perform those at larger schools. (Rideout 1978, p. 10)

A significant number of studies have been conducted relating specifically to school closure and student academic achievement. These studies allowed for greater control over the impact of the other variables and situations noted above. A review of these specific studies follows.

During the early 1970's, the Seattle, Washington, School District closed several schools due to enrollment decline since 1962. The district conducted a "Schools and Neighborhoods Research Study" to determine the impact and perceived impact of the closures on the students, parents and neighborhoods. In reporting the results of the academic component of this study, Donald Eismann found no statistically significant difference in student achievement scores after being transferred due to school closure.

In the impact study, a comparison of pre-and post-closure student achievement scores was used as a proxy for educational quality...In the Interlake/Allen post-closure comparison, no differences in achievement patterns exist between students who moved out of the former Interlake attendance area and students who remained. Reading and math scores of Interlake students who remained in the attendance area following closure were not measurably affected by reassignment to other schools. (Eismann 1976, p. 13)

He also found "that there was not an exodus of the more able students from the Mann attendance area following the school closure" (Eismann 1976, p. 13).
In 1986, Howard Ebmeier completed one of few research studies relating to the closure of a high school. He was able to complete pre-post-closure analysis of a sample of students at Wheaton Warrenville High School, in a suburb of Chicago, Illinois.

The first theme that seems to emerge from the extant data is the relative stability of student achievement. The closure of schools did not have any measurable impact on student grades or achievement as measured by standardized tests...Given that the transferred students were exposed to basically the same curriculum, teachers, course requirements and expectations it would be unlikely that significant differences in achievement would occur. While one might argue that student and parent attitudes might influence student motivational factors and thus achievement results, the linkages between the two for most students seem to be weak and temporal in nature. (Ebmeier, 1986, p. 27)

In order to have a comparison with high school students, Ebmeier also analyzed the standardized test scores of elementary students whose schools had closed. His findings indicate “that the net effect of reorganization on K-5 students who were transferred is slightly positive…” (Ebmeier, 1986, p. 23).

Two research studies included specific questions relating to children in early elementary grades who were transferred due to school closure. Meinecke (1980) looked at the standardized CTBS scores of second graders and fourth graders in San Francisco, California. “This was a descriptive study designed to determine whether there were significant changes in student achievement as a result of school closure and consolidation” (Meinecke, 1980, p. 1321). He found no statistically significant difference in academic achievement between the control group and the experimental group. He also was able to conclude that; “primary children are not more susceptible to achievement variation than
intermediate grade children” (Meinecke 1980, p. 1321). Thomas Byanski from Purdue University conducted a study in 1982 involving school closure and its impact on first, second and third graders. He, too, found that student achievement was not negatively impacted as a result of the transfer to a different school.

Results of the analysis of data indicated that for the study population the closing of a school and subsequent relocation of students did not affect the achievement scores of the students nor did it affect their attitude toward schooling...The relocation of students because of school closing does not adversely affect student achievement. (Byanski 1982, p. 3762)

Several researchers have included additional variables within their studies of the impact of school closure on academic achievement. Hersh (1987) and Cousin (1987) included gender as a variable when creating the matched samples for their research populations. Both used change on standardized test scores as the measure and both found no statistically significant difference on any of the variables measured. Cousin (1987) and Paolicchi (1982) analyzed attendance patterns for transferred or non-transferred students. Here the results differed. Cousin’s data “indicated that there was no significant difference between resident and transferred students in achievement or attendance on any of the variables tested” (Cousin, 1987, p.302). Paolicchi found student absenteeism to be significantly different between transferred and non-transferred students. He states: “Here a main effect for transfer existed across grade levels. Students in grades four, five, and six experienced a higher degree of post-transfer
absenteeism than their native counterparts who did not experience transfer” (Paolicchi, 1982, p.108). Knight (1981), Byanski (1982), and Hersh (1987) investigated student attitudes towards school and compared transferred and non-transferred students. At the end of the transfer year, Hersh and Byanski found no statistically significant difference in student attitudes. Knight found that attitudes varied depending on racial/ethnic group and whether the receiving school had a majority of the same ethnic group as the transferred students. Moody (1982) included rate of test score decline in his study of school closure and academic achievement, and found that, “group activity schools (those receiving transferred students) experienced less declining group test results after school closure” (Moody, 1982, p. 2222).

John Gallacher completed a study to determine the effects of school closing on academic achievement in a school district in Missouri in 1981. He used the Iowa Test of Basic Skills as the testing instrument and created matched pairs of transferred and non-transferred students in his sample. Based on his statistical findings, he concluded: “...it would appear that the academic performance of children transferred to another Keokuk elementary during the kindergarten through fifth grade years was not significantly effected by the change of schools” (Gallacher, 1981, p. 23).

In Cousin’s (1986) research on school closure in Baltimore, he found no statistically significant difference in reading and math performance between transferred and non-transferred students, as measured by performance on the
California Achievement Test. In a similar study, Robert Paolicchi (1982) used the Metropolitan Achievement Test to measure student achievement. He found that there was no overall significant difference in academic achievement between transferred fourth, fifth, and sixth graders and non-transferred students in the same grades. However, “in stratifying the data by gender, a previously hidden finding emerges” (Paolicchi, 1982, p. 87). He found that fifth grade transferred males had a significantly lower score in the language sub-test than fifth grade males who were not transferred (36.63 v. 39.85 mean scores), while fifth grade females showed no appreciable difference (41.23 v 41.59 mean scores in the language sub-test). When analyzing the data for sixth grade students, he found “that non-transferred sixth grade students possess a higher post-transfer mean in the area of mathematics” (Paolicchi, 1982, p. 97). However, when he controlled for mental ability by matching students based on the Otis-Lennon Mental Abilities Test, he found that “the main and interaction effects in all achievement areas revealed no significant finding for transferred and non-transferred students when analyzed by mental ability” (Paolicchi, 1982, p. 98). In Paolicchi’s study, as mentioned above, he did find a significant difference between transferred and non-transferred students in the area of absenteeism.

Transferred students possessed a higher absentee score than did their counterparts who were not transferred. The experimental group experienced a significantly higher rate of absenteeism than its non-transferred counterparts. The mean absence rate for all transferees is 10.63, which is compared to 8.29 for non-transferred subjects. However, this rate of absenteeism was apparently not high enough to have a detrimental effect on the transferees’ overall achievement. (Paolicchi, 1982, p. 110)
When reviewing the research and information relating to student mobility, Paolicchi found that student movement had a negative impact on student academic achievement. However, nine research studies conducted relating specifically to school closure and academic achievement found no significant difference between the academic achievement of transferred and non-transferred students. [Hersh (1987), Paolicchi (1982), Cousin (1987), Edgerton (1986), Byanski (1982), Meinecke (1980), Ebmeier (1986), Eismann (1976), Gallacher (1981)]. It is apparent that student movement due to family relocation and student movement due to school closures do not have the same impact on student academic achievement. Students who changed schools due to school closure did not suffer academically, compared to those children who changed schools due to family relocation.

While the review of literature indicates that students were not negatively impacted in academic achievement by school closure, none of the studies involve students or schools from Montana, and the vast majority of research studies were completed during the declining enrollment of the 1970's and 1980's. For these reasons, it is important to determine how current Montana students are impacted by school closure, as this information may help to inform those districts contemplating school closure in the near future.
CHAPTER 2

METHODOLOGY

Conceptual Framework

"Declining enrollment is just another in a series of problems to be solved. It too will become the basis for better education for all the children of this great nation" (Donald, 1980, p. 26). The issue of school closure as one response to the impact of declining enrollment has been studied by several researchers. Areas of study have included student attitude, community response, parent attitudes, financial benefits, student attendance and achievement. As school boards and administrators explore the options available to them when confronting declining enrollment, budget shortfalls and taxpayer demands, it is important that the decision-making process be informed and supported by research. Closing a school is an emotionally laden and politically explosive event in any community. Parents and community members are concerned with the potential impact of the closure on the neighborhood and its children.

This study attempted to measure one component of the effects of school closure: the impact on student academic achievement. Data from this study was analyzed to determine if there is a statistically significant difference between the academic achievement of transferred students and those able to remain in their
home schools. This study also investigated the interaction of gender, socioeconomic status, and transfer status on academic achievement of students.

**Population Description**

The population of this study consisted of all second and fourth grade students in the Helena Public Schools in Helena, Montana, and all third and fourth grade students from Bozeman Public Schools in Bozeman, Montana.

Helena is the state capital of Montana and is located on the eastern slopes of the Rocky Mountains with the Missouri River flowing nearby. The following description comes from the city’s webpage:

The city of Helena is located in southern Lewis and Clark County, Montana, along the eastern slope of the Continental Divide, at an elevation of 4,200 feet. Current population for the greater Helena valley is estimated at approximately 50,000 people - 25,000 residing within the city limits, 1,600 within the city of East Helena, 19,900 within unincorporated portions of southern Lewis & Clark county, and 3,500 within northern Jefferson county which borders the southern edge of the Helena city limits.

Principal employment centers within the area include federal, state and local government, Helena School District, St. Peter's Community hospital and Fort Harrison VA hospital and several health care facilities, Carroll College - a private Catholic college, University of Montana College of Technology, various industrial, manufacturing and commercial businesses, and agricultural operations in the area. (Montana Department of Commerce, 1999)

Unemployment in 1998 was 5.6 % statewide, with Lewis and Clark County showing a 4.8% unemployment rate. (Montana Department of Commerce, 1999).

The Helena, Montana, district has a student population of 8,250 in grades preschool through 12. These students attend two high schools, one alternative middle/high school, two middle schools, ten elementary schools and one special
education preschool. There is a certified staff of 550 FTE's (full time equivalents: there are at least 20 part-time certified employees). The ethnicity of the Helena students is predominantly Caucasian, with 94.2% white, 3.9% Native American, 1% Hispanic, 0.95% Asian/Pacific Islander, and 0.3% black. Socioeconomic status data, as indicated by participation in the free/reduced lunch federal program, shows that an average of 13.9% of district students are at or below the poverty level. In the 10 elementary schools, there is an average 5% absentee rate and average 21% mobility rate. Helena parents and community generally are involved and supportive of the school system, with 96% parent/teacher conference participation and total volunteer contribution in 1997-98 of 36,410 hours. The taxpayers consistently support district bond and levy elections, and there is never a shortage of candidates for school board elections.

Lincoln and Ray Bjork schools each had one classroom per grade level, eight schools have at least two classrooms per grade level, and two elementary schools have four classrooms per grade level. In addition, there are five multi-age Montessori classes in the district. According to the January, 2000 enrollment report, Helena district second grade enrollment is 475 students, and fourth grade enrollment is 520 students.

From the Bozeman, Montana, website comes the following information:

Bozeman, a city of 29,000, lies in the heart of the Gallatin Valley (altitude: 4,800 feet), a rich farmland of scenic grandeur in mountainous southwestern Montana. Bozeman, Montana, is the sixth largest city in Montana and the largest city in Gallatin County. It is the home of Montana State University, the largest unit in the state university system, with a student population of over 11,000. (Bozeman Chamber of Commerce, 1999)
Bozeman School District is a preK-12 district with seven elementary schools, two middle schools and one high school. The approximate enrollment for the 1999 school year is 5000 with fourth graders making up approximately 400 of that total and third graders constituting approximately 380. At the end of the 1997-98 school year, Willson Elementary School was closed. Willson had approximately 60 students in the third grade and 40 students in the second grade at that time. Because the Bozeman District has open enrollment, parents were able to choose which schools their children would attend for the 1998-99 school year. According to the district curriculum coordinator, approximately 1/3 of Willson students transferred to Longfellow School, 1/3 went to Irving School, and the remaining third returned to their neighborhood schools.

The population of the state of Montana is 92.7% Caucasian, with Native Americans comprising the next largest racial/ethnic group at 6%. (U.S. Bureau of the Census, 1990). While it is very important to determine if school closures affect one racial/ethnic group more than another, the small numbers of minority students in Helena and Bozeman prohibit meaningful disaggregation of data based on racial/ethnic status.

Sampling Plan

The sampling plan that was used in the study was the matched pair design. According to Kerlinger (1986), a research design is "an outline for conceptualizing the structure of the relationships among the variables of the research study...it also implies how the research situation is controlled and how
the data are to be analyzed" (p. 306). The matched pair design allows a correlation between groups and can be a desirable design when many variables can be matched. For this study, this researcher matched students in two independent variables: gender and transfer/non-transfer status at 3 different grade levels. Each second and fourth grader formerly attending Lincoln and Ray Bjork Schools and each third and fourth grader formerly attending Willson School in Bozeman during the 1997-1998 school year were matched by grade level, gender and aptitude with a student who did not attend Willson, Lincoln or Ray Bjork Schools during the 1997-1998 school year. Student aptitude was determined by the student's performance on the Test of Cognitive Skills, 2nd Edition. This researcher used students in second, third and fourth grade who previously attended Willson, Lincoln, and Ray Bjork schools for matched pairs. These students were matched with students who did not attend Willson, Lincoln, or Ray Bjork Schools during the 1997-1998 school year. Due to student movement during the summer, and some parent choices to enroll their transferred students in private schools or to home school, the number of students exiting the closed schools at the second, third, and fourth grade levels (139) is greater than the number of transferred students in this sample (117). The sample, then, consisted of 21 matched pairs of second graders, 34 matched pairs of third graders, and 62 matched pairs of fourth graders for a total of 117 matched pairs or 234 students.
Table 1: Students in this study transferred due to school closure

<table>
<thead>
<tr>
<th>Grade level</th>
<th>Closed Schools</th>
<th>Number of Students</th>
</tr>
</thead>
<tbody>
<tr>
<td>2(^{nd})</td>
<td>Lincoln and Ray Bjork</td>
<td>21 students</td>
</tr>
<tr>
<td>3(^{rd})</td>
<td>Willson</td>
<td>34 students</td>
</tr>
<tr>
<td>4(^{th})</td>
<td>Lincoln, Ray Bjork, Willson</td>
<td>62 students</td>
</tr>
</tbody>
</table>

**Hypotheses**

The null hypotheses for this study are:

1. There is no interaction among transfer status, socioeconomic status and gender on the academic achievement of second graders.
2. There is no interaction between transfer status and socioeconomic status on the academic achievement of second graders.
3. There is no interaction between transfer status and gender on the academic achievement of second graders.
4. There is no interaction between socioeconomic status and gender on the academic achievement of second graders.
5. There is no statistically significant difference between the academic achievement of transferred second graders and non-transferred second graders.
6. There is no statistically significant difference between the academic achievement of second grade students living in families of low socioeconomic status and second grade students living in families of high socioeconomic status.
socioeconomic status.

7. There is no statistically significant difference between the academic achievement of second grade female students and second grade male students.

8. There is no interaction among transfer status, socioeconomic status and gender on the academic achievement of third graders.

9. There is no interaction between transfer status and socioeconomic status on the academic achievement of third graders.

10. There is no interaction between transfer status and gender on the academic achievement of third graders.

11. There is no interaction between socioeconomic status and gender on the academic achievement of third graders.

12. There is no statistically significant difference between the academic achievement of transferred third graders and non-transferred third graders.

13. There is no statistically significant difference between the academic achievement of third grade students living in families of low socioeconomic status and third grade students living in families of high socioeconomic status.

14. There is no statistically significant difference between the academic achievement of third grade female students and third grade male students.

15. There is no interaction among transfer status, socioeconomic status and gender on the academic achievement of Helena fourth graders.
16. There is no interaction between transfer status and socioeconomic status on the academic achievement of Helena fourth graders.

17. There is no interaction between transfer status and gender on the academic achievement of Helena fourth graders.

18. There is no interaction between socioeconomic status and gender on the academic achievement of Helena fourth graders.

19. There is no statistically significant difference between the academic achievement of transferred Helena fourth graders and non-transferred Helena fourth graders.

20. There is no statistically significant difference between the academic achievement of Helena fourth grade students living in families of low socioeconomic status and Helena fourth grade students living in families of high socioeconomic status.

21. There is no statistically significant difference between the academic achievement of Helena fourth grade female students and Helena fourth grade male students.

22. There is no interaction among transfer status, socioeconomic status and gender on the academic achievement of Bozeman fourth graders.

23. There is no interaction between transfer status and socioeconomic status on the academic achievement of Bozeman fourth graders.

24. There is no interaction between transfer status and gender on the academic achievement of Bozeman fourth graders.

25. There is no interaction between socioeconomic status and gender on the
academic achievement of Bozeman fourth graders.

26. There is no statistically significant difference between the academic achievement of transferred Bozeman fourth graders and non-transferred Bozeman fourth graders.

27. There is no statistically significant difference between the academic achievement of Bozeman fourth grade students living in families of low socioeconomic status and Bozeman fourth grade students living in families of high socioeconomic status.

28. There is no statistically significant difference between the academic achievement of Bozeman fourth grade female students and Bozeman fourth grade male students.

**Independent and Dependent Variables**

The independent variables at three different grade levels were:

- Transfer status: whether or not a student was transferred to another district elementary school as a result of school closure.
- Gender: male or female
- Socioeconomic status: Low or not low as measured by eligibility for the free/reduced federal lunch program.

The dependent variable was student performance on the Comprehensive Test of Basic Skills, 4th Edition for Helena, Montana, second and fourth graders, and the Comprehensive Test of Basic Skills, 5th Edition for Bozeman, Montana, third and fourth graders.
Methods of Data Collection

Data on academic achievement was collected from individual student raw scores on the Comprehensive Test of Basic Skills, 4th Edition (CTBS/4) and Comprehensive Test of Basic Skills, 5th Edition (Terra Nova), in the areas of Total Reading, Total Language, and Total Mathematics. CTBS/4 was selected by the Helena, Montana, district in 1991 after an extensive study of district curriculum and various testing programs. In addition, the district conducted an alignment study in 1995 to determine the current degree of CTBS/4 and Helena curriculum alignment. For fourth grade skills, it was found that 83.3% of the test's objectives were evident in the district's essential skills list, and another 11.1% of the test's objectives were implied in the district's essential skills list. Hence, it was the district's conclusion that the CTBS/4 measures 94% of the district's fourth grade curriculum. For second grade skills, it was found that 77.7% of the test's objectives were evident in the district's essential skills list, and another 1.4% of the test's objectives were implied in the district's essential skills list. Hence, it was the district's conclusion that the CTBS/4 measures 79% of the district's second grade curriculum.

The developers of the CTBS/4 established the reliability of the test by using the Kuder-Richardson Formula 20 for internal consistency. "Based on a single administration of a test, this formula provides a reliability estimate that equals the average of all split-half coefficients that would be obtained on all possible divisions of the test into halves" (Williams, 1991, p.159). One half of the test is correlated with the other and then the Spearman-Brown formula is used to
adjust the correlation to apply to the entire test. The correlations determined by this method for the total battery has a KR20 of .93, .94 or .95 at all grade levels.

Discussions of the test's reliability and validity were found in the Buros Institute of Mental Measurement documents.

- Conditional standard errors of measurement reported in the Norms Books...provide more information than traditional measures of reliability and show consistency across forms on all tests. In addition, CSEM provide information needed for better interpretation of individual scores. The use of CSEM continues to be an important positive feature of CTBS/4. (p. 219)

- CTBS/4 is one of the better achievement test batteries available to school districts...In addition it is a technically sound test battery that includes strong features such as conditional standard errors of measurement. (p. 220)

The CTBS/4 was standardized in 1988 with approximately 300,000 students in grades K-12 from throughout the country, and from both public and private schools. Montana was included in this standardization process. (Williams, 1991, p. 88).

The Comprehensive Test of Basic Skills, 5th Edition is the newest version of the CTBS basic skills standardized test, published in 1996. This edition "is designed to provide continuity with the previous editions of CTB tests to facilitate evaluation of performance growth and instructional effectiveness over a period of time" (CTB, 1996, p. 9). The developers of the CTBS/5 established the reliability of the test by using the Kuder-Richardson Formula 20 for internal consistency. "Based on a single administration of a test, this formula provides a reliability estimate that equals the average of all split-half coefficients that would be obtained on all possible divisions of the test into halves" (Williams, 1991. p. 159).
One half of the test is correlated with the other and then the Spearman-Brown formula is used to adjust the correlation to apply to the entire test. The correlations determined by this method for the CTBS Complete Battery Plus has a KR20 of .95 (second grade), .97 (third grade) and .97 (fourth grade). (CTB, 1997, p. 139). The CTBS/5 was standardized in April, 1996 with 100,650 students in kindergarten through grade 12 involved.

The Test of Cognitive Skills, 2nd Edition, is the aptitude test that was used when matching students by ability level. This test, also published by CTB McGraw/Hill, measures academic aptitude through verbal, non-verbal and memory components. The test provides a score called the Cognitive Skills Index (CSI) which is a score with an average of 100 and a standard deviation of 15, providing educators a number with characteristics similar to the standard IQ score. The TCS/2 was standardized in 1991 with a total of approximately 70,000 students nationwide. Montana was included in the norming process. CTB/McGraw/Hill used experts to review the test for age, racial, ethnic and gender bias, and also undertook an extensive content review. “Content reviewers examined the items in terms of the reasoning processes involved, the nature of the distracters, the apparent difficulty levels and the perceived degree of ‘fit’ for each item with respect to its sub-test” (TCS, 1992, p. 12).

**Control Over Extraneous Variables**

It was the intent of this researcher to follow what Fred Kerlinger (1986) calls the 'maxmincon' principle when designing a research study. This principle
means that the researcher must maximize experimental variance, minimize error variance and control extraneous variables. "If the independent variable does not vary substantially, there is little chance of separating its effect from the total variance of the dependent variable" (Kerlinger 1986, p. 287). In spite of the fact that this was an ex post facto study rather than an experimental design, it was still imperative that extraneous variables be controlled as much as possible as this minimized threats to internal validity and allowed this writer to "attribute differences in the dependent variable to the independent variable" (Strohmeyer, 1996).

This researcher had no control over selection bias because she did not select which students would experience a school closure. By choosing a matched sample design, the impact of this bias is minimized. Because all students in the sample were tested using the same instrument and are in the same grade level within each school district, maturation and instrumentation threats have been addressed. Error variance could also be attributed to gender and aptitude of individual students. Due to this, these characteristics were independent variables and were used to create the matched samples. Error variance could also be a result of socioeconomic status as determined by student participation in the National School Lunch Program. In the attempt to gather necessary data to control for this variable, this researcher was denied access to the Bozeman School District data due to the interpretation of U.S. Department of Agriculture guidelines by the Director of Federal Food Programs, Office of Public
Instruction (M. McAulay, personal communication, December 1, 1999).

Therefore, socioeconomic status was not able to be included as a variable.

While both Irving and Longfellow Elementary Schools in Bozeman, Montana, had multi-age classrooms in 1998, many Bozeman students who transferred from Willson School were moving from multi-age classrooms to single age classrooms in the receiving Bozeman schools. This change from multi-age to single age settings could have also been an extraneous variable affecting student performance. However, research has shown that there is no statistically significant difference in the academic performance of students in these two different classroom configurations. (Way, 1979 and Gorrell, 1998) Therefore, classroom configuration was not addressed as an extraneous variable.

**Procedures**

The following steps were taken to complete the research for this study:

1. Students who attended Lincoln and Ray Bjork Elementary Schools in Helena, Montana during the 1997-1998 school year were identified. Students who attended Willson Elementary School in Bozeman, Montana during the 1997-1998 school year were identified. Students who were in grades one and three in Helena and grades two and three in Bozeman during the 1997-1998 school year were selected for this study and are identified as the transferred students.
2. Test scores for these selected students were identified. These test scores were from the 1998-1999 school year, when the students were in second, third and fourth grade respectively.

3. Each selected student was further identified as to ability level and gender.

4. From the population of Helena district second and fourth graders and Bozeman district third and fourth graders, students were identified who matched the individual transfer students in the areas of ability level and gender. These students are identified as the non-transfer students.

5. Test scores from the CTBS and TCS/2 were obtained for all study participants.

6. Statistical analyses were completed on the data.

7. The questions formulated for this study were answered, and the results of hypothesis testing were written.

8. Summary, conclusions and recommendations were written.

Analysis of Data

This study compared the achievement scores of children who were transferred from their school due to school closures and those children who were not transferred. By matching transferred and non-transferred students by grade, level, gender, and aptitude, this researcher was able to analyze more than one independent variable and provide more definitive information.

Data was analyzed using the two-factor analysis of variance. According to Glass and Hopkins (1996), "The statistical technique known as the analysis of
variance (ANOVA) is used to determine whether the differences among the means are greater than would be expected from sampling error alone" (p. 377). The multi-factor analysis of variance allows the researcher to investigate interaction between factors. Again, Glass and Hopkins question: "Are there certain combinations of the two factors that produce separately different effects from what would be expected from the two factors considered separately" (1996, p. 482). The absence of interaction allows the researcher to generalize the results to all students of that characteristic (gender, transfer status). Using a multi-factor analysis of variance allowed this researcher to determine if there was an interaction between the transfer status of a student and gender.

Hypotheses from this study were tested at the .05 level of significance. This alpha level was chosen because it minimized the possibility of rejecting a true null (Type I error) or accepting a false null (Type II error). Student raw scores from the CTBS/4 and CTBS/5 achievement tests were used as the dependent variable.

**Limitations and Delimitations**

1. This study is delimited to second and fourth grade students attending public elementary schools in the Helena, Montana, School District and students in third and fourth grade attending public schools in the Bozeman, Montana, School District.

2. Due to the lack of ethnic diversity in the Helena and Bozeman Districts (94% Caucasian), the conclusions from this study are limited to Caucasian boys and girls. American Indian, Hispanic, Asian and Black students are included in the study, but not in numbers significant enough to allow conclusions.
3. Due to the inaccessibility of National School Lunch Program student eligibility data in the Bozeman school district, socioeconomic status was not able to be included as an independent variable in this study.

4. This study is limited to the academic achievement of students who were transferred due to school closure and those who were not transferred.
CHAPTER 3

FINDINGS AND INTERPRETATIONS

Introduction

The purpose of this study was to determine if there was a difference between the academic achievement of transferred students due to the closing of their elementary school and the academic achievement of students able to remain in their home school, and if transfer status interacted with gender. This was done through identifying the students who were forced to change schools due to school closure, creating matched pairs at second, third and fourth grades with students who remained in their home schools. Results from the Comprehensive Test of Basic Skills, 4th and 5th Editions, in the areas of reading, language and mathematics were analyzed to determine if there was a statistically significant difference between transferred and non-transferred students at the three grade levels and by gender. This chapter includes the statistical analysis of the data and the tests of hypotheses.

The chapter is organized in the following order: population and sample of student matched pairs, hypotheses, statistical analysis used, and a statistical analysis at each grade level in the three sub-test areas.
Population and Sample

The population of this study consisted of all second and fourth grade students in the Helena Public Schools in Helena, Montana, and all third and fourth grade students from Bozeman Public Schools in Bozeman, Montana, during the 1998-1999 school year. From this population, students who attended Willson School in Bozeman during 1997-1998 while in grades two and three, and students who attended Lincoln and Ray Bjork Schools in Helena during 1997-1998 while in grades one and three were identified. Their test scores from the spring of the 1999 school year were obtained. These transferred students were matched by gender and aptitude at each grade level with non-transferred students from their respective districts. The sample, then, consisted of 21 matched pairs of second graders, 34 matched pairs of third graders, and 62 matched pairs of fourth graders for a total of 117 matched pairs or 234 students. Table 2 on page 56 summarizes the population and sample information from Bozeman and Helena School Districts. Included in this table is the total population of this study, the number of students transferred and the number of non-transferred students from each of the districts’ elementary schools. Student mobility accounts for the difference between the total number of students transferred due to school closure (139) and the number of transferred students included in this study (117).
Table 2: Summary of population and sample data from Bozeman and Helena Districts

<table>
<thead>
<tr>
<th>District</th>
<th>School</th>
<th>Grade</th>
<th>Total Enrollment</th>
<th>Number Transferred</th>
<th>Number in Study</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bozeman</td>
<td>Willson</td>
<td>3</td>
<td>39</td>
<td>39</td>
<td>34</td>
</tr>
<tr>
<td></td>
<td>Dickenson</td>
<td></td>
<td>28</td>
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<td></td>
<td>Morning Star</td>
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<td>Whittier</td>
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<td>Hawthorne</td>
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<td>1806</td>
<td>139</td>
<td>234</td>
</tr>
</tbody>
</table>
Hypotheses

Hypothesis 1 stated there is no interaction among transfer status, socioeconomic status and gender on the academic achievement of second graders. Hypothesis 2 stated there is no interaction between transfer status and socioeconomic status on the academic achievement of second graders. Hypothesis 3 stated there is no interaction between transfer status and gender on the academic achievement of second graders. Hypothesis 4 stated there is no interaction between socioeconomic status and gender on the academic achievement of second graders and hypothesis 5 stated there is no statistically significant difference between the academic achievement of transferred second graders and non-transferred second graders. Hypothesis 6 stated there is no statistically significant difference between the academic achievement of second grade students living in families of low socioeconomic status and second grade students living in families of high socioeconomic status. Hypothesis 7 stated there is no statistically significant difference between the academic achievement of second grade female students and second grade male students.

Hypothesis 8 stated there is no interaction among transfer status, socioeconomic status and gender on the academic achievement of third graders. Hypothesis 9 stated there is no interaction between transfer status and socioeconomic status on the academic achievement of third graders. Hypothesis 10 stated there is no interaction between transfer status and gender on the academic achievement of third graders. Hypothesis 11 stated there is no interaction between socioeconomic status and gender on the academic
achievement of third graders and hypothesis 12 stated there is no statistically significant difference between the academic achievement of transferred third graders and non-transferred third graders. Hypothesis 13 stated there is no statistically significant difference between the academic achievement of third grade students living in families of low socioeconomic status and third grade students living in families of high socioeconomic status. Hypothesis 14 stated there is no statistically significant difference between the academic achievement of third grade female students and third grade male students.

Hypothesis 15 stated there is no interaction among transfer status, socioeconomic status and gender on the academic achievement of Helena fourth graders. Hypothesis 16 stated there is no interaction between transfer status and socioeconomic status on the academic achievement of Helena fourth graders. Hypothesis 17 stated there is no interaction between transfer status and gender on the academic achievement of Helena fourth graders and hypothesis 18 stated there is no interaction between socioeconomic status and gender on the academic achievement of Helena fourth graders. Hypothesis 19 stated there is no statistically significant difference between the academic achievement of transferred Helena fourth graders and non-transferred Helena fourth graders. Hypothesis 20 stated there is no statistically significant difference between the academic achievement of Helena fourth grade students living in families of low socioeconomic status and Helena fourth grade students living in families of high socioeconomic status. Hypothesis 21 stated there is no statistically significant difference between the academic achievement of Helena
fourth grade female students and Helena fourth grade male students.

Hypothesis 22 stated there is no interaction among transfer status, socioeconomic status and gender on the academic achievement of Bozeman fourth graders. Hypothesis 23 stated there is no interaction between transfer status and socioeconomic status on the academic achievement of Bozeman fourth graders. Hypothesis 24 stated there is no interaction between transfer status and gender on the academic achievement of Bozeman fourth graders and hypothesis 25 stated there is no interaction between socioeconomic status and gender on the academic achievement of Bozeman fourth graders. Hypothesis 26 stated there is no statistically significant difference between the academic achievement of transferred Bozeman fourth graders and non-transferred Bozeman fourth graders. Hypothesis 27 stated there is no statistically significant difference between the academic achievement of Bozeman fourth grade students living in families of low socioeconomic status and Bozeman fourth grade students living in families of high socioeconomic status. Hypothesis 28 stated there is no statistically significant difference between the academic achievement of Bozeman fourth grade female students and Bozeman fourth grade male students.

**Descriptive Statistical Analysis**

Hypotheses 3, 5, 7, 10, 12, 14, 17, 19, 21, 24, 26, and 28 were tested using a two-way analysis of variance statistical procedure (ANOVA). The 2-way ANOVA was run for each grade level with the number correct (raw) scores from the CTBS
subtests of reading, language and mathematics. Any significant interactions between transfer status and gender at each grade level and any significant main effects of transfer status or gender were analyzed. The results of these analyses are presented in Tables 3 through 14. In all analyses, the alpha level was set at .05 to determine retention or rejection of the null hypothesis. Hypotheses 1,2,4,6,8,9,11,13,15,16,18,20,22,23,25, and 27 were not tested because socioeconomic data for Bozeman was not accessible and the sample size for Helena second and fourth grades did not allow for the inclusion of this third variable in the analysis.

**Second Grade**

Table 3: Second Grade - Tests of Between-Subjects Effects
Dependent Variable: Total Language CTBS

<table>
<thead>
<tr>
<th>Source</th>
<th>Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>F</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Transfer Status</td>
<td>45.539</td>
<td>1</td>
<td>45.539</td>
<td>.511</td>
<td>.479</td>
</tr>
<tr>
<td>Gender</td>
<td>4.880</td>
<td>1</td>
<td>4.880</td>
<td>.055</td>
<td>.816</td>
</tr>
<tr>
<td>Transfer Status X Gender</td>
<td>19.254</td>
<td>1</td>
<td>19.254</td>
<td>.216</td>
<td>.645</td>
</tr>
<tr>
<td>Error</td>
<td>3383.962</td>
<td>38</td>
<td>89.052</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>3453.635</td>
<td>41</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Table 4: Second Grade -Tests of Between-Subjects Effects
Dependent Variable: Total Math CTBS

<table>
<thead>
<tr>
<th>Source</th>
<th>Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>F</th>
<th>Sig</th>
</tr>
</thead>
<tbody>
<tr>
<td>Transfer Status</td>
<td>1.615</td>
<td>1</td>
<td>1.615</td>
<td>.014</td>
<td>.907</td>
</tr>
<tr>
<td>Gender</td>
<td>132.931</td>
<td>1</td>
<td>132.931</td>
<td>1.145</td>
<td>.291</td>
</tr>
<tr>
<td>Transfer Status X Gender</td>
<td>43.520</td>
<td>1</td>
<td>43.520</td>
<td>.375</td>
<td>.544</td>
</tr>
<tr>
<td>Error</td>
<td>4412.596</td>
<td>38</td>
<td>116.121</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>4590.662</td>
<td>41</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 5: Second Grade -Tests of Between-Subjects Effects
Dependent Variable: Total Reading CTBS

<table>
<thead>
<tr>
<th>Source</th>
<th>Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>F</th>
<th>Sig</th>
</tr>
</thead>
<tbody>
<tr>
<td>Transfer Status</td>
<td>.938</td>
<td>1</td>
<td>.938</td>
<td>.008</td>
<td>.930</td>
</tr>
<tr>
<td>Gender</td>
<td>108.366</td>
<td>1</td>
<td>108.366</td>
<td>.915</td>
<td>.345</td>
</tr>
<tr>
<td>Transfer Status X Gender</td>
<td>4.747</td>
<td>1</td>
<td>4.747</td>
<td>.040</td>
<td>.842</td>
</tr>
<tr>
<td>Error</td>
<td>4501.077</td>
<td>38</td>
<td>118.449</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>4615.128</td>
<td>41</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Hypotheses 3, 5 and 7 addressed student achievement and transfer status by gender at the second grade level. Table 3 shows the results of the
statistical analysis for the language CTBS sub-test, Table 4 shows the results for the math sub-test and Table 5 shows the results for the reading sub-test. In the area of language, the p-value for the main effect of transfer status was .479, for the main effect of gender was .816 and for the interaction between gender and transfer status was .645. In the area of math, the p-value for the main effect of transfer status was .907, for the main effect of gender was .291 and for the interaction between gender and transfer status was .544. In the area of reading, the p-value for the main effect of transfer status was .930, for the main effect of gender was .345 and for the interaction between gender and transfer status was .842. In each academic area, there is no statistically significant difference for the interaction between gender and transfer status at the .05 alpha level, nor a statistically significant difference for the main effects of transfer status or gender. Therefore, hypotheses 3, 5, and 7 are retained.

**Third Grade**

Table 6: Third Grade - Tests of Between-Subjects Effects
Dependent Variable: Total Language CTBS

<table>
<thead>
<tr>
<th>Source</th>
<th>Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>F</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Transfer Status</td>
<td>17.719</td>
<td>1</td>
<td>17.719</td>
<td>.541</td>
<td>.465</td>
</tr>
<tr>
<td>Gender</td>
<td>66.425</td>
<td>1</td>
<td>66.425</td>
<td>2.030</td>
<td>.159</td>
</tr>
<tr>
<td>Transfer Status X Gender</td>
<td>7.219</td>
<td>1</td>
<td>7.219</td>
<td>.002</td>
<td>.963</td>
</tr>
<tr>
<td>Error</td>
<td>2094.591</td>
<td>64</td>
<td>32.728</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>2185.954</td>
<td>67</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Table 7: Third Grade - Tests of Between-Subjects Effects  
Dependent Variable: Total Math CTBS

<table>
<thead>
<tr>
<th>Source</th>
<th>Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>F</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Transfer Status</td>
<td>.535</td>
<td>1</td>
<td>.535</td>
<td>.009</td>
<td>.925</td>
</tr>
<tr>
<td>Gender</td>
<td>23.826</td>
<td>1</td>
<td>23.826</td>
<td>.396</td>
<td>.531</td>
</tr>
<tr>
<td>Transfer Status X Gender</td>
<td>23.535</td>
<td>1</td>
<td>23.535</td>
<td>.391</td>
<td>.534</td>
</tr>
<tr>
<td>Error</td>
<td>3848.992</td>
<td>64</td>
<td>60.141</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>3896.888</td>
<td>67</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Hypotheses 10, 12 and 14 addressed student achievement and transfer status by gender at the third grade level. Table 6 shows the results of the statistical analysis for the language CTBS sub-test, Table 7 shows the results for
the math sub-test and Table 8 shows the results for the reading sub-test. In the area of language, the p-value for the main effect of transfer status was .465, for the main effect of gender was .159 and for the interaction between gender and transfer status was .963. In the area of math, the p-value for the main effect of transfer status was .925, for the main effect of gender was .531 and for the interaction between gender and transfer status was .534. In the area of reading, the p-value for the main effect of transfer status was .899, for the main effect of gender was .359 and for the interaction between gender and transfer status was .941. In each academic area, there is no statistically significant difference for the interaction between gender and transfer status at the .05 alpha level, nor a statistically significant difference for the main effects of transfer status or gender. Therefore, hypotheses 10, 12, and 14 are retained.

**Fourth Grade – Helena**

Table 9: Tests of Between-Subjects Effects
Dependent Variable: Total Language CTBS

<table>
<thead>
<tr>
<th>Source</th>
<th>Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>F</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Transfer Status</td>
<td>115.009</td>
<td>1</td>
<td>115.009</td>
<td>.488</td>
<td>.488</td>
</tr>
<tr>
<td>Gender</td>
<td>5.394</td>
<td>1</td>
<td>5.394</td>
<td>.023</td>
<td>.880</td>
</tr>
<tr>
<td>Transfer Status X Gender</td>
<td>1.533</td>
<td>1</td>
<td>1.533</td>
<td>.000</td>
<td>.994</td>
</tr>
<tr>
<td>Error</td>
<td>12738.585</td>
<td>54</td>
<td>235.900</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>12860.521</td>
<td>57</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Table 10: Tests of Between-Subjects Effects  
Dependent Variable: Total Math CTBS

<table>
<thead>
<tr>
<th>Source</th>
<th>Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>F</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Transfer Status</td>
<td>552.397</td>
<td>1</td>
<td>552.397</td>
<td>1.861</td>
<td>.178</td>
</tr>
<tr>
<td>Gender</td>
<td>225.685</td>
<td>1</td>
<td>225.685</td>
<td>.760</td>
<td>.387</td>
</tr>
<tr>
<td>Transfer Status X Gender</td>
<td>104.054</td>
<td>1</td>
<td>104.054</td>
<td>.351</td>
<td>.556</td>
</tr>
<tr>
<td>Error</td>
<td>16029.255</td>
<td>54</td>
<td>296.838</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Total</td>
<td>16911.391</td>
<td>57</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 11: Tests of Between-Subjects Effects  
Dependent Variable: Total Reading Score CTBS

<table>
<thead>
<tr>
<th>Source</th>
<th>Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>F</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Transfer Status</td>
<td>158.063</td>
<td>1</td>
<td>158.063</td>
<td>.693</td>
<td>.409</td>
</tr>
<tr>
<td>Gender</td>
<td>30.309</td>
<td>1</td>
<td>30.309</td>
<td>.133</td>
<td>.717</td>
</tr>
<tr>
<td>Transfer Status X Gender</td>
<td>20.493</td>
<td>1</td>
<td>20.493</td>
<td>.090</td>
<td>.765</td>
</tr>
<tr>
<td>Error</td>
<td>12313.195</td>
<td>54</td>
<td>228.022</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Total</td>
<td>12522.060</td>
<td>57</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Hypotheses 17, 19 and 21 addressed student achievement and transfer status by gender at the fourth grade level for Helena students. Table 9 shows the results of the statistical analysis for the language CTBS sub-test, Table 10
shows the results for the math sub-test and Table 11 shows the results for the reading sub-test. In the area of language (Table 9), the p-value for the main effect of transfer status was .488, for the main effect of gender was .880 and for the interaction between gender and transfer status was .994. In the area of math (Table 10), the p-value for the main effect of transfer status was .178, for the main effect of gender was .387 and for the interaction between gender and transfer status was .556. In the area of reading (Table 11), the p-value for the main effect of transfer status was .409, for the main effect of gender was .717 and for the interaction between gender and transfer status was .765. In each academic area, there is no statistically significant difference for the interaction between gender and transfer status at the .05 alpha level, nor a statistically significant difference for the main effects of transfer status or gender. Therefore, hypotheses 17, 19, and 21 are retained.

**Fourth Grade – Bozeman**

Table 12: Tests of Between-Subjects Effects
Dependent Variable: Total Language CTBS

<table>
<thead>
<tr>
<th>Source</th>
<th>Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>F</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Transfer Status</td>
<td>17.982</td>
<td>1</td>
<td>17.982</td>
<td>.380</td>
<td>.540</td>
</tr>
<tr>
<td>Gender</td>
<td>167.453</td>
<td>1</td>
<td>167.453</td>
<td>3.542</td>
<td>.065</td>
</tr>
<tr>
<td>Transfer Status X Gender</td>
<td>1.154</td>
<td>1</td>
<td>1.154</td>
<td>.024</td>
<td>.876</td>
</tr>
<tr>
<td>Error</td>
<td>2930.986</td>
<td>62</td>
<td>47.274</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>3117.575</td>
<td>65</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Table 13: Tests of Between-Subjects Effects  
Dependent Variable: Total Math CTBS

<table>
<thead>
<tr>
<th>Source</th>
<th>Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>F</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Transfer Status</td>
<td>15.398</td>
<td>1</td>
<td>15.398</td>
<td>.169</td>
<td>.683</td>
</tr>
<tr>
<td>Gender</td>
<td>7.800</td>
<td>1</td>
<td>7.800</td>
<td>.086</td>
<td>.771</td>
</tr>
<tr>
<td>Transfer Status X Gender</td>
<td>160.171</td>
<td>1</td>
<td>160.171</td>
<td>1.757</td>
<td>.190</td>
</tr>
<tr>
<td>Error</td>
<td>5652.281</td>
<td>62</td>
<td>91.166</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>5835.650</td>
<td>65</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 14: Tests of Between-Subjects Effects  
Dependent Variable: Total Reading Score CTBS

<table>
<thead>
<tr>
<th>Source</th>
<th>Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>F</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Transfer Status</td>
<td>5.585</td>
<td>1</td>
<td>5.585</td>
<td>.063</td>
<td>.803</td>
</tr>
<tr>
<td>Gender</td>
<td>25.181</td>
<td>1</td>
<td>25.181</td>
<td>.284</td>
<td>.596</td>
</tr>
<tr>
<td>Transfer Status X Gender</td>
<td>13.135</td>
<td>1</td>
<td>13.135</td>
<td>.148</td>
<td>.702</td>
</tr>
<tr>
<td>Error</td>
<td>5504.623</td>
<td>62</td>
<td>88.784</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>5548.524</td>
<td>65</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Hypotheses 24, 26 and 28 addressed student achievement and transfer status by gender at the fourth grade level for Bozeman students. Table 12 shows the results of the statistical analysis for the language CTBS sub-test,
Table 13 shows the results for the math sub-test and Table 14 shows the results for the reading sub-test. In the area of language (Table 12), the p-value for the main effect of transfer status was .540, for the main effect of gender was .065 and for the interaction between gender and transfer status was .876. In the area of math (Table 13), the p-value for the main effect of transfer status was .683, for the main effect of gender was .771 and for the interaction between gender and transfer status was .190. In the area of reading (Table 14), the p-value for the main effect of transfer status was .803, for the main effect of gender was .596 and for the interaction between gender and transfer status was .702. In each academic area, there is no statistically significant difference for the interaction between gender and transfer status at the .05 alpha level, nor a statistically significant difference for the main effects of transfer status or gender. Therefore, hypotheses 24, 26, and 28 are retained.
CHAPTER 4

SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

Introduction

During the last two decades, district administrators and local school boards have been faced with the difficult dilemma of exercising fiscal responsibility while maintaining small neighborhood schools. Declining enrollment has added to this issue, causing many communities and districts to face the possibility and reality of closing schools and consolidating school populations. In Montana, legislative funding concerns and declining enrollment have forced this decision in several districts during the last few years. Bozeman School District closed Willson Elementary Magnet School at the end of the 1998 school year, and Helena School District closed both Lincoln and Ray Bjork Elementary Schools at the same time. The Missoula District closed Roosevelt and Dickenson Elementary Schools at the end of the 1999 school year, and both Billings and Great Falls district school boards may be faced with similar decisions in the near future.

The closing of a neighborhood school impacts the community, parents and children of that school. Because the major goal of public education is student learning, it was important to determine if the recent school closures in Montana had an impact on student achievement.
The purpose of this study was to determine if there was a statistically significant difference between the achievement of students who were forced to transfer due to school closure and those students who were able to remain in their home school. The study included students in grades 2 and 4 from the Helena, Montana, public schools, and students in grades 3 and 4 from the Bozeman, Montana, public schools. Academic data came from the raw scores obtained on the Comprehensive Test of Basic Skills sub-tests of reading, language and math. The data was analyzed using a two-way analysis of variance with the alpha level of .05 as the level of statistical significance. This researcher also assessed the academic impact of school closure on students by gender, and attempted to incorporate socioeconomic status. However, because of OPI interpretation of the U.S. Department of Agriculture school lunch guidelines, this data was inaccessible from the Bozeman District, therefore socioeconomic status was not included in the analysis.

Summary

This chapter summarizes the results of this study, answers the questions posed in Chapter I, draws conclusions from the results and makes recommendations for future study and current practice.

General findings include:

1. Second grade students in Helena, Montana, public schools who were transferred due to the closure of Lincoln and Ray Bjork Schools did as well as their non-transferred counterparts in the areas of reading, language
and mathematics. There was no statistically significant difference in the means of their raw scores on the CTBS standardized test.

2. Second grade girls in the Helena public schools who were transferred due to school closure did as well as their non-transferred counterparts in the areas of reading, language and mathematics. There was no statistically significant difference in the means of their raw scores on the CTBS standardized test as analyzed by gender and transfer status.

3. Second grade boys in the Helena public schools who were transferred due to school closure did as well as their non-transferred counterparts in the areas of reading, language and mathematics. There was no statistically significant difference in the means of their raw scores on the CTBS standardized test as analyzed by gender and transfer status.

4. There was no statistically significant difference in the mean scores of second grade girls and boys in the Helena public schools.

5. Third grade students in Bozeman, Montana, public schools who were transferred due to the closure of Willson Elementary School did as well as their non-transferred counterparts in the areas of reading, language and mathematics. There was no statistically significant difference in the means of their raw scores on the CTBS standardized test.

6. Third grade girls in the Bozeman public schools who were transferred due to school closure did as well as their non-transferred counterparts in the areas of reading, language and mathematics. There was no statistically
significant difference in the means of their raw scores on the CTBS standardized test as analyzed by gender and transfer status.

7. Third grade boys in the Bozeman public schools who were transferred due to school closure did as well as their non-transferred counterparts in the areas of reading, language and mathematics. There was no statistically significant difference in the means of their raw scores on the CTBS standardized test as analyzed by gender and transfer status.

8. There was no statistically significant difference in the mean scores of third grade girls and boys in the Bozeman public schools.

9. Fourth grade students in Bozeman and Helena public schools who were transferred due to the closure of Willson, Lincoln and Ray Bjork Schools did as well as their non-transferred counterparts in the areas of reading, language and mathematics. There was no statistically significant difference in the means of their raw scores on the CTBS standardized test.

10. Fourth grade girls in the Bozeman and Helena public schools who were transferred due to school closure did as well as their non-transferred counterparts in the areas of reading, language and mathematics. There was no statistically significant difference in the means of their raw scores on the CTBS standardized test as analyzed by gender and transfer status.

11. Fourth grade boys in the Bozeman and Helena public schools who were transferred due to school closure did as well as their non-transferred counterparts in the areas of reading, language and mathematics. There
was no statistically significant difference in the means of their raw scores on the CTBS standardized test as analyzed by gender and transfer status.

12. There was no statistically significant difference in the mean scores of fourth grade girls and boys in the Helena public schools.

The results of the data analysis and the above findings answer the following questions posed in Chapter 1 of this study.

**Question 3:** Was there an interaction between transfer status and gender on the academic achievement of second graders?

The second grade students did not have a statistically significant difference in their mean scores as analyzed by gender and transfer status.

**Question 5:** Was there a statistically significant difference between the academic achievement of transferred second graders and non-transferred second graders?

The second grade students did not have a statistically significant difference in their mean scores as analyzed by transfer status.

**Question 7:** Was there a statistically significant difference between the academic achievement of second grade female students and second grade male students?

The second grade students did not have a statistically significant difference in their mean scores as analyzed by gender.

**Question 10:** Was there an interaction between transfer status and gender on the academic achievement of third graders?

The third grade students did not have a statistically significant difference in their mean scores as analyzed by gender and transfer status.

**Question 12:** Was there a statistically significant difference between the
academic achievement of transferred third graders and non-transferred third graders?

The third grade students did not have a statistically significant difference in their mean scores as analyzed by transfer status.

**Question 14:** Was there a statistically significant difference between the academic achievement of third grade female students and third grade male students?

The third grade students did not have a statistically significant difference in their mean scores as analyzed by gender.

**Question 17:** Was there an interaction between transfer status and gender on the academic achievement of fourth graders?

The fourth grade students did not have a statistically significant difference in their mean scores as analyzed by gender and transfer status.

**Question 19:** Was there a statistically significant difference between the academic achievement of transferred fourth graders and non-transferred fourth graders?

The fourth grade students did not have a statistically significant difference in their mean scores as analyzed by transfer status.

**Question 21:** Was there a statistically significant difference between the academic achievement of fourth grade female students and fourth grade male students?

The fourth grade students did not have a statistically significant difference in their mean scores as analyzed by gender.

Questions 1,2,4,6,8,9,11,13,15,16,18, and 20 could not be answered due to the unavailability of socioeconomic status data from Bozeman School District.
Conclusions

From the research and statistical analysis of the achievement data from Helena and Bozeman, Montana, school districts, the following conclusions are made:

1. For the general population, school closure and subsequent student population consolidation do not significantly impact the academic achievement of elementary students.

2. There is no significantly different impact on male or female students who experience school closure.

Discussion

During school closure hearings in Eugene, Oregon, one parent made an emotional statement to the school board. "My children going to a new school are not going to get the attention they need, not get their work done, not learn their work and do it right, how will they become good citizens. Do you want your kids to be dummies? I don't" (Brott, 1981, p. 87). This impassioned plea from a distraught parent clearly summarizes one of the primary issues surrounding the debate to close schools: will student learning suffer? Thomas Donald, Superintendent of Schools in Salt Lake City, Utah, discussed the school closure process and issues he experienced in the late 1970's. He indicates that, "the welfare of children is the most important concern of parents. Improving the quality of education is the most powerful way of obtaining public support for closing schools" (Donald, 1980, p. 24). There is a greater chance of parental
acceptance of school closure if the emphasis is less on financial savings and more on benefits to the children. The nature of our business does not allow us to offer guarantees when educational changes are made. As professionals, we can only draw on the past experience of others to inform and support our decisions. While much of the research on school closure indicates that students are not harmed by the event, it is the passage of time that allows parents and communities to incorporate that knowledge into their own experience.

Ben Brodinsky, a superintendent in Oklahoma, compares public reaction to the announcement of school closure to the "stages a patient goes through when told he has a terminal illness. First there is denial...then comes anger...next is the bargaining stage...this is followed by depression...then comes acceptance" (Brodinsky, 1981, p.6). These stages were clearly evidenced in Helena, Montana, during the closure of Lincoln and Ray Bjork Schools. When the initial discussions began, parents and some staff members held on to the belief that somehow the schools would remain open, and that necessary cuts would come from other places. As this became less a possibility, the anger emerged. School Board meetings were packed with adults and media, parents addressed the board with options and accusations, letters to the editor were regularly published in the local newspaper, and the children of district level employees were harassed in school and during sporting events. The bargaining phase occurred when Ray Bjork parents came to the board with an alternative budget proposal that allowed their school to stay open one more year in hopes that the district's financial circumstances might improve. This budget relied
heavily on district contingency funds and would have placed the district at high
risk should something happen that required emergency funding. On April 24,
1998, the Helena Board of Trustees voted to close Ray Bjork and Lincoln
Schools. They would end operation as elementary schools on June 6th. This
vote began the stage of depression, which lasted well into the next school year.
Ray Bjork parents were angry and depressed over the loss of their neighborhood
school and found it very difficult to be initially supportive of the new school
programs. Jefferson Parent Council meetings were well attended and
contentious, parents gathered on the Jefferson playground in small clusters,
trying to identify errors and safety concerns, and Jefferson teachers were
confronted and closely monitored by the distressed parents on a daily basis. In
the second year following the closure of Ray Bjork, this researcher now observes
a sense of acceptance and support by most parents. Volunteerism has
increased and remains consistently high, parents are no longer as vigilant on the
playground and in classrooms, and many have indicated to the building
administrator that the experiences in the new school were very positive for their
children. It has been interesting to observe the difference in this grieving process
between the parents of Lincoln and Ray Bjork Schools. Lincoln parents reached
the acceptance stage much more quickly than the Ray Bjork parents, and did not
take as active a role in the anger or bargaining phase, compared to the Ray Bjork
parents. Speculation about this phenomenon causes this researcher to
contemplate the resilience of lower income families who may have experienced
more loss and instability in their lives as opposed to the security and
complacency of wealthier families who may not be as accustomed to situations where their control and influence does not alter the situation. Lincoln parents were not as active in the school closure dialogue and did not actively oppose the closure compared to the parents of Ray Bjork students. Two former Ray Bjork parents have run for and been elected to the school board, and a third is planning to run in the April, 2000 elections. Thomas Donald, Salt Lake City, Utah, school superintendent, discussed the politicizing of school closure issues when he stated:

The possibilities for political influence and subtle pressures exist in every potential decision. When related to school closure, one must always be alert to such conditions...Questions of justice, fairness and equity must be discussed often and openly. Whether a school is attended by rich children or poor children is not the issue...It requires a balance between cold logic and human emotions. (Donald, 1980, p.25)

Both Helena and Bozeman, Montana, have closed schools, and this study indicates that students were not impacted academically by forced movement due to school closure. Missoula, Montana, District is in its first year of schooling after the closure of Dickenson and Roosevelt Elementary schools, and Billings and Great Falls, Montana, may consider school closure in the next several years if current enrollment decline and subsequent funding constraints continue. Because school closure is such a contentious and emotional issue in communities and towns, school boards and administrators would be well served with research data that provides information as they enter the deliberation and decision-making process.
Previous research in the area of school closure and student achievement occurred during the late 1970's and 1980's and, additionally, this author found no research conducted on the impact of school closures in Montana. As school boards and communities explore the possibilities brought about by declining enrollment, aging facilities, and declining educational funding, the results from this study provides information which may give guidance to districts facing this difficult decision-making process.

**Recommendations for Practice**

The results and conclusions from this study lead to the following recommendations for school boards and local school districts:

1. Information and conclusions from this study may offer support and guidance during school closure hearings and deliberations in Montana. Parents, school staff, and community members should be informed of the results of this study.

2. In the decision-making process surrounding school closures, Montana administrators should refer to the results of this study when addressing concerns regarding the impact of school closures on student academic achievement.

3. The results of this study will provide information to the communities of Helena and Bozeman regarding the impact of school closure on the academic achievement of their children. Therefore, the results of this study should be shared with the superintendents of both Helena and Bozeman School Districts.
4. Student transition activities and continuity of instruction and curriculum appear to be important components of student and parent comfort after school closures. The findings of this study should not diminish a district’s efforts to support the students and their families during school closures.

**Recommendations for Study**

1. This study encompassed achievement data one year after school closure. However, all educational institutions have as a goal, the graduation of successful learners and productive citizens. It is unknown whether forced transfer due to school closure will have any long-term effects on the students from Lincoln, Ray Bjork and Willson Elementary Schools. Longitudinal studies should be undertaken to determine if there is a long-term impact on students who were forced to transfer due to school closure. Included in this study should be achievement measures, attendance statistics, attitude measures, student surveys, parent surveys, graduation rates, and the social and emotional impact on children and their families.

2. During the Montana spring testing cycle in 2001, school districts will be required to identify students participating in Title I and Special Education programs on the test answer sheets. This will allow for disaggregation of testing data. It is recommended that a study be conducted to determine if students in special populations who were forced to transfer due to school closure were academically impacted. Because Title I school participation is determined by percentage participation in the Federal School Lunch Program,
the Title I information testing mentioned above would also allow some information to be obtained as to the impact of school closure on students from families living in a lower socioeconomic status. It is recommended that future achievement data be disaggregated to identify the impact of school closure on students of different socioeconomic status as determined by eligibility for the National School Lunch Program.

3. Because the percent of minority students in this study was too small to allow for disaggregation of data, no findings on the impact of school closure on minority students in Helena and Bozeman were possible. However, it is often these students who are severely affected by disruption of a system that has learned to accommodate differences and support the unique culture of its minority communities. Because of this, it is recommended that a study be done to determine the impact of school closure on minority students in Montana. Of particular interest are Native American children and the children of Hmong families in Missoula.

4. This was a study of school closure in two larger Montana cities. Montana is a largely rural state with “457 operating school districts ...and 38 percent of students enrolled in the fourteen largest districts” (Neilson, 1999, p. 9). Therefore 62 percent of Montana’s students attend school in 443 small districts. A study exploring the impact of school closure and/or district consolidation in smaller rural communities in Montana would further inform board and administrative deliberations which could result in school closures.

5. As follow-up to school closures due to financial constraints and declining
enrollment, districts should determine and publish the financial results of school closure. The consolidation of services can allow more efficient management of school facilities and provide a wider variety of programs for a greater number of students under one roof. However, there are often improvements of that ‘one roof’ that may offset the savings gained from closing a school. Other considerations which should be computed into the bottom line are extrapolation of the first year’s savings over several years, the possibility of revenue from leasing or selling the closed facility, and the emergence of any unanticipated revenues or expenses after the schools were closed. Students, parents, employees and taxpayers have a right to know if there was a substantial enough cost savings and improvement of educational opportunity to justify the disruption of their schools and families.
References Cited


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