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ABSTRACT

To determine the effects of a hot breakfast program on elementary school students' academic achievement, absenteeism, and lateness behaviors, a study was undertaken of standardized achievement test scores for 23 second-, fourth-, fifth- and sixth-graders at an elementary school participating in a district-wide breakfast program. Specifically, the study sought to test the hypotheses that there would be no statistically significant relationships between test scores and participation in the breakfast program, student economic status, gender, participation in a reading program, and race. Data were also collected for a control group of 30 second-, fourth-, fifth-, and sixth-graders at a school not participating in the program. The study found no statistically significant effects on test scores for breakfast program participants related to economic status, gender, participation in a reading program, race, or number of times the student was tardy. However, data indicated that sixth-graders' achievement test scores in Total Language Arts were positively related to participation in the breakfast program. Also, sixth-grade students who participated in the program had significantly more absences than those who did not. Tables of findings and sample correspondence related to study organization are included. Contains 15 references. (BCY)

A HOT BREAKFAST PROGRAM IN AN ELEMENTARY SCHOOL

being

A Thesis Presented to the Graduate Faculty

of the Fort Hays State University in

Partial Fulfillment of the Requirements for

the Degree of Master of Science

by

Sheryl Neeland

B.S., Fort Hays State University

Date 3-18-93 Approved Bill Hadley
Major Professor

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Chair, Graduate Council

Graduate Committee Approval

The Graduate Committee of Sheryl Neeland hereby approves her field study as meeting partial fulfillment of the requirements for the Degree of Master of Science.

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Table of Contents

List of Appendixes

List of Tables

Abstract

The purpose of the researcher was to investigate a hot breakfast program. The independent variables were participation status, economic status, gender, Chapter I reading status, and race. The dependent variables were Total Battery, Total Reading, Total Language Arts and Total Mathematics scores from the Comprehensive Tests of Basic Skills, total number of absences and total number of times tardy. Scores from the Survey of Basic Skills (SRA scores) were employed as covariant measures (composite null hypotheses one through five, number absences for previous year for composite null six, and total number of times tardy for previous year for composite null seven). The sample consisted of 53 subjects from two elementary schools. The experimental group consisted of 23 students from the second, fourth, fifth, and sixth grades. The control group consisted of 30 students from the second, fourth, fifth, and sixth grades. Seven composite null hypotheses were tested at the .05 level of significance employing a single-factor analysis of covariance.

A total of 31 comparisons were tested. All 31 comparisons were main effects. Two of the 31 comparisons were statistically significant at the .05 level. The statistically significant main effects were for the following: sixth grade for the independent variable participation status and the dependent variable Total Language Arts; and sixth grade for the independent variable participation status and the dependent variable of absences. The significant comparisons indicated the following: sixth grade students who participated in the hot breakfast program had statistically significant higher achievement in Total Language Arts than those who did not participate; and sixth grade students who participated had statistically significant more absences than those who did not participate.

The results of the present study appeared to support the following generalizations:

1) an association between participation in a hot breakfast program and achievement test scores for sixth graders in Total Language Arts,
2) an association between participation in a hot breakfast program and absenteeism rates for sixth grade,

3) no association between participation in a hot breakfast program according to economic status and achievement test scores,
4) no association between participation in a hot breakfast program according to gender and achievement test scores,
5) no association between participation in a hot breakfast program according to Chapter I reading status and achievement test scores,
6) no association between participation in a hot breakfast program according to race and achievement test scores, and
7) no association between participation in a hot breakfast program according to number of times tardy and achievement test scores.

Introduction

In 1966, Congress created the school hot breakfast program which was initially authorized as a two-year pilot program under the Child Nutrition Act of 1966. The school hot breakfast program was created to provide a breakfast, on school days, to low-income children who would otherwise have none ("Rural Development", 1991). Congress established the school hot breakfast program as an entitlement program in 1975, which provided federal funds to schools and residential child care institutions to assist in providing a nutritious morning meal to children. The funds were used to provide a school hot breakfast at no cost to children whose family income was not greater than 130% of the federal poverty level, at reduced-price to those whose family income fell between 130 and 185% of poverty, and at full price to all others ("Child Nutrition", 1990). In this way the program allowed for full student participation and insured against social stigma.

There is some indication breakfast may be a problem for a substantial number of United States students. The most recent U.S. Department of Agriculture study of child nutrition programs, The National Evaluation of School Nutrition Programs (1983, cited in Cooney & Heitman, 1987), revealed that a number of students would eat a nutritious morning meal if one was provided in their school. With one in every five children today living in poverty (one in every two black children), school breakfast is a fairly simple proposition that deals with a huge problem (Tingling-Clemmons, 1991). "Yet, despite the breakfast program's growth-from 40,000 schools in May 1989 to 42,800 in May 1990-it is still vastly under-utilized. About 4 million students eat breakfast in school, compared to 25 million who eat school lunches daily," (Tingling-Clemmons, 1991, p. 35). The commitment to provide nutrition to as many students as possible was demonstrated by recent legislative refinement. Federal legislative changes (Public Law 99-661, enacted in 1986, cited in Cooney & Heitman, 1987) made the school hot breakfast program more financially feasible to school districts. The Child Nutrition and WIC Reauthorization Act of 1989 (Public Law 101-147) provided new funds to cover one-time breakfast program start-up costs (see Appendix C).

The purpose of breakfast is to "Break The Fast" or interrupt the time of fasting that has been created due to a night of sleep. "While you are sleeping at night, your body is still at work. Your heart pumps blood, you breathe and your body works to keep its temperature just right" ("Why Break", 1970, p. 3). When you get up, you need quick energy to start the day and lasting energy to get you through the morning. Children do not have the reserves to go for long periods of time without food.

Breakfast is a meal that is frequently omitted by people in all age groups. The goal of the school hot breakfast program is to provide children with the opportunity to eat a nutritious morning meal and ensure their readiness to learn. The following depict stated reasons for not eating breakfast: ". . . lack of appetite in the morning, not enough time, disinterest in foods frequently served for breakfast, longtime habit of skipping breakfast, cutting down on meals to control weight" (Ford, 1973, p. 3). The unstated reasons may be equally important, especially for children: "inadequate funds to buy food for three meals, parents working irregular hours so children must prepare their own meals, lack of information on what to eat or how to prepare it, failure of families to eat together" (Ford, 1973, p. 4).

According to surveys, hunger and undernutrition are substantial problems among today's youth, particularly low-income children. Hunger was defined in the following way by Futrell (1989, p. 7) "as a physiological and psychological state resulting when immediate food needs are not met." Undernutrition is the physiological state resulting from "a prolonged lack of food with specific symptom that can be detected in height and weight, physical examinations and biochemical (blood) tests. It can be a problem of either quantity or nutritional quality" (Futrell, 1989, p. 7).

More than 33.5 million people in the U.S. lived below the poverty line in 1990, according to the Census Bureau (cited in Tingling-Clemmons, 1991). " More than 20 percent of all U.S. children are poor" (Tingling-Clemmons, 1991, p. 31). "Government surveys show that as income decreases, so does the nutritional adequacy of diets. The poverty level itself is based in part on what it costs to purchase a minimally adequate

diet" (Futrell, 1989, p. 7). This means that families living at or below the poverty level are going to have a difficult time buying even a minimally adequate diet.

While the impact of mild undernutrition cannot be easily measured, Tingling-Clemmons (1991, p. 31) stated the following:

1. Undernutrition increases the risk of illness and its severity.
2. Undernutrition has a negative effect on children's ability to learn. It is difficult to isolate and measure the effects of chronic under nutrition because many other aspects of poverty may negatively affect a child's development. However, the consensus of research in this area is that undernutrition does have an independent effect on learning and behavior.
3. The learning-related effects of undernutrition begin before any visible signs of growth retardation occur. Undernourished children are less physically active, less attentive, independent, or curious. They are more anxious, less responsive socially and cannot concentrate as well. As a result, their reading ability, verbal skills and motor skills suffer. These effects do not have to be permanent if better nutrition is provided and the environment is improved.
4. Iron deficiency anemia is a specific kind of under nutrition, and one of the most prevalent nutritional problems among U.S. children. Even mild cases lead to shortened attention span, irritability, fatigue and decreased ability to concentrate. Anemic children do poorly on vocabulary, reading, mathematical, problem-solving and psychological tests.

The Community Childhood Hunger Identification Project (CCHIP, cited in Tingling-Clemmons, 1991), focusing upon the assessment of hunger among America's school-age children reported that 12.3 % of the families in the U.S. go through the typical day hungry. Five and one-half million of the hungry are children. Tingling-Clemmons (1991, p. 31), identified reasons why hunger hampers children's ability to learn:

1. Hunger leads to nervousness, irritability, disinterest in the learning situation and the inability to concentrate. The hungry child is passive, apathetic, timid and demands little from his environment.

2. Hunger probably has no permanent effects on the brain but it does disrupt the learning process--one developmental step is lost and it is difficult to move on to the next one.

Healthy growth and development are influenced more through good nutrition than by other factors. Researchers have reported an association between eating breakfast and the increased ability to learn. Krause & Hunscher (1972, p. 277) stated that:

> From the beginnings of growth in the prenatal period to the time when the child attains his full size as an adult, the food that he eats and his ability to convert that food into energy and new body tissue will influence the state of his health not only as a child but throughout life.

A 1950 study ("Complete Summary", 1976) was conducted over a period of 10 years with 121 subjects. The subjects included school boys from a local school, university students who were classified as middle aged and community members who were classified as the older group.

During the experiment involving school boys, while the total daily food allowance was rigidly controlled and the boys were in school, the teacher in charge of the group made careful observations and records of the attitudes and scholastic attainments of the boys ("Complete Summary", 1976). The report showed "that the majority of the boys had a definitely better attitude and a better scholastic record during the period when breakfast was included in the daily dietary regimen than when it was omitted" ("Complete Summary", 1976, p. 18). The conclusions from the study were ("Complete Summary", 1976, p. 19):

1. The omission of breakfast results in decreased efficiency in the late morning hours, which is reflected in poorer physiologic performance.
2. The omission of breakfast was demonstrated to result in poorer attitude toward schoolwork and to detract from scholastic attainments.

A 1987 study conducted in Lawrence, Massachusetts, with low-income students in the 3rd through 6th grade, showed that "the achievement test scores of children in one year when their school had no

breakfast program were compared with the scores of the same children in the following year when they participated in a newly initiated breakfast program" (Meyers, Sampson, Weitzman, Kayne, 1989, p. 8). The researchers compared low-income students participating in the school hot breakfast program with students not participating. The Comprehensive Test of Basic Skills achievement test scores improved for both groups, as would be expected from one year to the next. However, the increase was greater for students participating in the school hot breakfast program. On a scale of 200 to 800, children who had received breakfast improved their scores an average of 48.4 points over the previous year, while those who did not receive school hot breakfasts improved 40.9 points (CTBS Total Battery p value of .0049, CTBS Total Language p value of .0238). The study also reported that participation in the school hot breakfast program was associated with decreased rates of tardiness (Tardiness Rate p value of .0014). Absence rates increased for both groups, but the increase was less for the school hot breakfast participants (Meyers et al, 1989). The Lawrence study reported the relationship between nutrition and learning for low-income students in breakfast programs.

The authors, Meyers et al (1989, p. 8) stated:

> In this study of the effects of a newly-implemented school breakfast program we have found a small but statistically significant positive association between participation in the breakfast program and improvement in standardized achievement test scores and in tardiness. These data do suggest that participation in the school breakfast program by low-income children has real benefits for their academic function, tardiness rates, and perhaps absenteeism.

Jensen (1990) conducted research pertaining to breakfast and performance at the Baylor College of Medicine in Texas. Jensen studied the effects of skipping breakfast on 39 subjects. The subjects were 9 to 11 years of age and well-nourished children. The children were admitted overnight to a metabolic ward for testing, where half received a good breakfast and half received no breakfast. All the children were screened ahead of time to include those with both low and high IQs in each group.

During the late morning hours, both of the groups were given problem-solving tests, which also included IQ tests.

The researchers found that skipping breakfast had a detrimental effect on children's late-morning problem-solving performance. The children who did not have breakfast did not learn as well and had lower scores than the children who ate breakfast. Blood tests of both groups showed that blood sugar levels were higher in the group that ate breakfast. The researchers concluded that the "no breakfast" group probably was not using brain fuel as efficiently as the "breakfast" group (Jensen, 1990).

In summary, researchers have generated results that demonstrated the association between nutrition and learning. Child nutrition programs, like the school hot lunch program and the school hot breakfast program, have the potential to help students have access to two nutritious meals every day. The research results cited in related literature indicated that nutrition programs have a positive effect on children's nutritional status and learning ability.

Statement of Problem

The purpose of the researcher was to investigate the effects of a school hot breakfast program.

Importance of the Research

School board members, administrators, teachers, and parents, as well as interested citizens who are looking for ways nutritional status can be improved, may find this study beneficial. Teachers, counselors, and school nurses who are interested in improving learning may find that this study provides additional information. This study consolidates sources in one place. A combination of variables that have not been analyzed previously were investigated in this study.

The results of the present study provided information pertaining to the following questions:

1. Is there an association between participation in a hot breakfast program and achievement test scores?

2. Is there an association between participation in a hot breakfast program and achievement test scores according to economic status?

3. Is there an association between participation in a hot breakfast program and achievement test scores according to gender?

4. Is there an association between participation in a hot breakfast program and achievement test scores according to membership in Chapter I reading?

5. Is there an association between participation in a hot breakfast program and achievement test scores according to race?

Composite Null Hypotheses

All hypotheses were tested at the .05 level of significance.

1. The difference between the adjusted posttest mean Comprehensive Tests of Basic Skills scores (with SRA Survey of Basic Skills scores as the covariant measure) according to participation status in a hot breakfast program will not be statistically significant.

2. The difference between the adjusted posttest mean Comprehensive Tests of Basic Skills scores for those who participated in a hot breakfast program (with SRA Survey of Basic Skills scores as the covariant measure) according to economic status will not be statistically significant.

3. The difference between the adjusted posttest mean Comprehensive Tests of Basic Skills scores for those who participated in a hot breakfast program (with SRA Survey of Basic Skills scores as the covariant measure) according to gender will not be statistically significant.

4. The difference between the adjusted posttest mean Comprehensive Tests of Basic Skills scores for those who participated in a hot breakfast program (with SRA Survey of Basic Skills scores as the covariant measure) according to Chapter I reading participation status will not be statistically significant.

5. The difference between the adjusted posttest mean Comprehensive Tests of Basic Skills scores for those who participated in a hot breakfast program (with SRA Survey of Basic Skills scores as the covariant measure) according to race will not be statistically significant.

6. The difference between the adjusted posttest mean number of absences (with absenteeism for the previous year as the covariant

measure) according to participation status in a hot breakfast program will not be statistically significant.

7. The difference between the adjusted posttest mean number of times tardy (with tardiness for the previous year as the covariant measure) according to participation status in a hot breakfast program will not be statistically significant.

Definition of Variables

Independent Variables

The independent variables were:

1. participation status--two levels,
   level one, participation in hot breakfast program, and
   level two, nonparticipation in hot breakfast program;
2. economic status--two levels,
   level one, those who paid full price, and
   level two, those who paid reduced price or received breakfast free;
3. gender--two levels,
   level one, female, and
   level two, male;
4. Chapter I reading status--two levels,
   level one, participation in Chapter I reading, and
   level two, nonparticipation in Chapter I reading; and
5. race--two levels,
   level one, Caucasian, and
   level two, minorities.

Dependent Variables

The dependent variables were scores from the following subscales of the Comprehensive Tests of Basic Skills.

1. Total Battery - this score represents the addition of six parts of the test, total possible score of 0-268.

2. Total Reading - 40 items for vocabulary and 50 items for comprehension, total possible score of 0-90.

3. Total Language - 36 items for language mechanics and 48 items for language expression, total possible score of 0-84.

4. Total Mathematics - 44 items for math computation and 50 items for math concepts and application, total possible score of 0-94.

5. Total Number of Absences for spring semester of the target year - total possible number of 90.

6. Total Number of Times Tardy for spring semester of the target year - total possible number of 90 .

Covariant Measure

Scores from the following subscales of the Survey of Basic Skills (SRA) for Ist, 3rd, 4th, and 5th grades were employed as covariant measures:

1. Composite,
2. Reading Total.
3. Language Arts Total, and
4. Mathematics Total

Limitations

The following might have affected the results of the present study:

1. samples were not random,
2. sample sizes were very small, and
3. all subjects came from 2 elementary schools from a school district which had 7 elementary schools.

Methodology

Setting

The city in which the study was conducted has a population of approximately 16,000. This city has a diverse economy centered on agricultural, oil, and manufacturing. The oil economy is depressed at the present time. The major employers are a meat processing plant and a plant that manufactures small items. There is a community college 4 miles from the city.

This medium size city in central Kansas has a total of seven elementary schools in the district. Students from two schools were selected for the sample. The subjects from one school were in the experimental group and the subjects from the other school were in the control group. The experimental group consisted of 23 students from an elementary school with a hot breakfast program. The enrollment at this school was 295 with a classroom staff of 17. Special services offered at this

school include learning disability, trainable mentally handicapped, educational mentally handicapped, early childhood handicapped, transitional first grade, and Chapter I reading. The control group consisted of 30 students from an elementary school which did not have a hot breakfast program. The enrollment at this school was 303 with a classroom staff of 13. Special services offered at this school include learning disability and Chapter I reading.

Subjects

The student needed to participate 50% of the time in the school hot breakfast program and have covariant (SRA) and posttest achievement scores to be included in the experimental sample. The possibility of using grades 1-6 was examined. However, this was eliminated due to the lack of covariant scores for 1st grade. Third grade students were excluded because of the reduced number of students that participated 50% of the time in the school hot breakfast program. The number of students who met the criteria of participation in the school hot breakfast program and complete tests scores consisted of 8 second grade students, 4 fourth grade students, 5 fifth grade students, and 6 sixth grade students. The experimental group consisted of 23 students.

The students in the control group did not have access to a hot breakfast program at their school. The students in the control group were identified by obtaining a roster for each grade level and using every 6th student. The number of subjects in the control group consisted of 8 second grade students, 9 fourth grade students, 6 fifth grade students, and 7 sixth grade students. The control group consisted of 30 students.

Instruments

Two instruments were used. The SRA Survey of Basic Skills (SBS) was used as a covariant measure. The Comprehensive Tests of Basic Skills (CTBS) was used as a posttest.

Survey of Basic Skills. The SBS was developed and published by Science Research Associates. The SRA's Survey of Basic Skills (SBS) (Avila,1985, p. 2) described the instrument as:

> a battery of norm-reference, standardized tests in basic curriculum areas for grades K-12, designed to survey students' general

academic achievement. The contents of SBS are based on learner objectives most commonly taught in the United States.

The SBS User's Manual provided a brief description of the data collected during the research program associated with the SBS (Avila, 1985, p. 5):

> The standardization of SBS, Forms P and Q, was designed to provide national norms for both fall and spring testing. Testing for standardization was done in the fall of 1983 in grades 1 through 12, and in the spring of 1984 in kindergarten through grade 12. The design called for a matched sample from spring to fall. Approximately 80% of the students in the spring program also participated in the fall program. Interpolated norms are available for students who are tested in any quarter month of the school year. The following scales were employed: Composite, Reading Total, Language Arts Total, and Mathematics Total.

Comprehensive Tests of Basic Skills. The Comprehensive Tests of Basic Skills, Fourth Edition ((CTBS/4) Sullivan, 1990, p. 3):

> is a test series designed to measure achievement in the basic skills taught in schools throughout the nation. The subject areas measured are reading, language, spelling, mathematics, study skills, science, and social studies. Items for CTBS/4 are organized by content categories that reflect the educational objectives commonly found in state and district curriculum guides and in major textbooks, basal series, and instructional programs.

To develop the norms for CTBS/4, a sample of students were selected who represented the national student population. The schools were selected to provide a heterogeneous, generally representative sample of students. Separate samples of Black and Hispanic students were also obtained to give additional information about the performance of the items with different ethnic groups. The final version of the test was administered to the national sample in the spring and fall of 1988. Data from this sample were used to develop the test norms (Sullivan, 1990, p. 7). The following scales were employed: Total Battery, Total Reading, Total Language Arts, and Total Mathematics.

Implementation

A before and after school programs committee had met during the 1990-91 school year. The committee had recommended beginning a school hot breakfast program in the school district after a site visitation of breakfast programs and survey of breakfast needs was given to parents. The hot breakfast program began as a pilot program at one elementary school in the school district on October 1, 1991. The hot breakfast program was served from 7:55 a.m to 8:10 a.m. In order to participate in the breakfast program the students had an extended day. The student had to arrive earlier than the 8:30 a.m. start of the school day. Several students arrived at school as early as 7:30 a.m. because of their parents work schedule. This program allows these children a chance to eat breakfast prior to the beginning of the school day. Some students are not ready to eat breakfast early in the morning and this program allows the student an opportunity to eat breakfast when they are hungry. Some students were able to receive breakfast free due to their economic status, other students received breakfast at a reduced price of 30 cents, and other students paid the full price of 65 cents.

The school breakfast must contain, at a minimum, the following food items:

1. One-half pint serving of fluid milk as a beverage, on cereal or both.
2. One-half cup of fruit or vegetable, or full strength fruit juice or vegetable juice. It is recommended that a food rich in Vitamin C be served daily.
3. Two servings of bread or bread alternate. A serving is one slice of whole grain or enriched bread, biscuits, muffins, rolls or 3/4 cup (one ounce) of cereal.
4. Two servings of meat or meat alternate. One ounce of meat, poultry, fish or cheese, 1/2 large egg, two tablespoons peanut butter, four tablespoons cooked dry beans or peas, or one ounce of nuts and/or seeds is equal to one serving.

A sample breakfast menu may include:

1. Monday - orange juice, cereal, and milk
2. Tuesday - chilled peaches, little smokies, toast, and milk

3. Wednesday - orange juice, french toast sticks/syrup, and milk
4. Thursday - apple juice, cheese pizza slice, and milk
5. Friday - orange juice, biscuit/sausage, and milk

Design

A covariant measure posttest design was employed. The following design was employed with each composite null hypothesis:

composite null hypothesis number one, a single-factor design with participation status as the independent variable;

composite null hypothesis number two, a single-factor design with economic status as the independent variable;

composite null hypothesis number three, a single-factor design with gender as the independent variable;

composite null hypothesis number four, a single-factor design with Chapter I reading as the independent variable;

composite null hypothesis number five, a single-factor design with race as the independent variable;

composite null hypothesis number six, a single-factor design with participation status as the independent variable and absenteeism as the dependent variable; and

composite null hypothesis number seven, a single-factor design with participation status as the independent variable and tardiness as the dependent variable.

McMillan and Schumacher (1984) cited 10 threats to internal validity. These were dealt with in the present study in the following ways:

1. history--a covariant measure posttest design was employed;
2. selection--all subjects who met the criterion of 50% participation in the school hot breakfast program and had complete test scores were included in the experimental group and the control group was identified by obtaining a roster for each grade level and using every 6th student;
3. statistical regression--there were no extreme subjects;
4. testing--a covariant measure posttest design was employed;
5. instrumentation--a covariant measure posttest design was employed;

6. mortality--all subjects who met the criterion of 50% participation in the school hot breakfast program and had complete test scores were included in the experimental group and the control group was identified by a roster for each grade level and using every 6th student;

7. maturation--a covariant measure posttest design was employed;

8. diffusion of treatment--no treatment was administered, participation was investigated;

9. experimenter bias--no treatment was administered and the data were collected by someone other than the researcher; and

10. statistical conclusion--one mathematical assumption was violated (random sampling); therefore, the results should be generalized only to similar subjects.

McMillan and Schumacher (1984) cited two threats to external validity. These were dealt with in the present study in the following ways:

1. population external validity--sample was not random; therefore, the results should be generalized only to similar subjects; and

2. ecological external validity--data were collected using standard procedures by someone other than the researcher and no treatment was given. No adjustments were made for the fact that the students in the control group may have eaten a hot breakfast at home.

Data Collecting Procedures

The elementary school from which the subjects were taken was the only one of seven in the district to implement a school hot breakfast program. The building principal was contacted in order to obtain permission to conduct the study.

Standardized achievement tests were administered annually in elementary grades 1-6. The SRA Survey of Basic Skills was administered in the fall of 1990. The Comprehensive Test of Basic Skills (CTBS) was administered in the spring of 1992. The school hot breakfast program was implemented in this school starting in October 1991.

The experimental group included all students in grades 2, 4, 5, and 6 who had participated 50% of the time in the school hot breakfast program and had covariant and posttest scores. The 50% participation status was suggested in the related literature. The school hot breakfast program

participation was recorded on site by school personnel from October 1991 through May, 1992.

SRA Survey of Basic Skills scores and Comprehensive Test of Basic Skills scores were taken from the school files. Economic status, gender, Chapter I reading participation status, and race were obtained from a code on the CTBS score for the experimental group. The absence and tardiness records of each child for the spring semester were obtained from regular classroom reports.

The control group was from an elementary school which has not participated in the school hot breakfast program. The building principal was contacted in order to obtain permission to conduct the study. The enrollment size at this school was similar and it also qualified as a Chapter I school. The control group was identified by obtaining a roster for the 2nd, 4th, 5th, and 6th grade levels. Every 6th student's SRA Survey of Basic Skills scores and Comprehensive Test of Basic Skills score were taken from the school files. The absence and tardiness records of each child for the spring semester were obtained from regular classroom reports.

After all the information was taken from the file the data were coded as needed. A data sheet was prepared for the computing center at Fort Hays State University. Data analyses were provided by the computing center at Fort Hays State University.

Research Procedures

The research project was implemented in 10 steps:

1. research topic was identified,
2. an electronic search of related literature (ERIC),
3. a research proposal was written,
4. the research proposal was defended,
5. subjects were identified,
6. data were collected,
7. data were analyzed,
8. the research report was written,
9. the final research report was defended, and
10. final editing of the research report.

Data Analyses

The following were compiled:

1. appropriate descriptive statistics,
2. single-factor analysis of covariance, and
3. least sums of squares test of means.

Results

The purpose of the researcher was to investigate the effects of a school hot breakfast program. The independent variables investigated were participation status, economic status, gender, Chapter I reading and race. The dependent variables employed were Total Battery, Total Reading, Total Language Arts and Total Mathematics scores from the Comprehensive Tests of Basic Skills, total number of absences and total number of times tardy. Seven composite null hypotheses were tested and the following designs were employed:

composite null hypothesis number one, a single-factor design with participation status as the independent variable;

composite null hypothesis number two, a single-factor design with economic status as the independent variable;

composite null hypothesis number three, a single-factor design with gender as the independent variable;

composite null hypothesis number four, a single-factor design with Chapter I reading as the independent variable;

composite null hypothesis number five, a single-factor design with race as the independent variable;

composite null hypothesis number six, a single-factor design with participation status as the independent variable and absenteeism as the dependent variable; and

composite null hypothesis number seven, a single-factor design with participation status as the independent variable and tardiness as the dependent variable.

The results section was organized according to composite null hypotheses for ease of reference. Information pertaining to each composite null hypothesis was presented in a common format for ease of comparison.

It was hypothesized in composite null hypothesis number one that the difference between the adjusted posttest mean Comprehensive Tests of Basic Skills scores (with SRA Survey of Basic Skills scores as the covariant measure) according to participation status in a hot breakfast program would not be statistically significant. Table 1 contains information pertaining to composite null hypothesis number one. The following were cited in Table 1: variable, group sizes, covariant means, covariant standard deviations, posttest means, posttest standard deviations, adjusted posttest means, F values, and p levels.

Table 1: A Comparison of Adjusted Posttest Mean Comprehensive Test of Basic Skills Scores with SRA Survey of Basic Skills Scores as the Covariant Measure According to Participation Status Employing Single-Factor Analysis of Covariance.

Variable	n	Covariant m	Covariant s	Posttest m	Posttest s	Adjusted Posttest m	F value	p level
Second Grade				Total Battery				
Participation Status								
Participation	8	186.5	49.02	662.0	45.17	671.2		
							0.03	.8667
Nonparticipation	8	210.5	42.13	678.5	37.10	669.3		
				Homogeneity of Regression			0.19	.6674
				Total Reading				
Participation Status								
Participation	8	191.9	45.22	663.5	58.76	684.9		
							0.43	.5214
Nonparticipation	8	234.8	30.03	691.0	49.66	669.6		
				Homogeneity of Regression			0.43	.5249
				Total Language Arts				
Participation Status								
Participation	8	187.4	51.02	681.1	42.42	687.5		
							0.00	.9968
Nonparticipation	8	244.5	72.14	693.9	25.35	687.5		
				Homogeneity of Regression			4.51	0552
				Total Mathematics				
Participation Status								
Participation	8	199.1	42.57	642.0	50.18	636.7		
							1.25	.2832
Nonparticipation	8	189.1	30.40	649.4	49.72	654.7		
				Homogeneity of Regression			0.04	.8367

(continued)

Table 1 (continued)

Variable	n	Covariant m	Covariant s	Posttest m	Posttest s	Adjusted Posttest m	F value	p level
Fourth Grade				Total Battery				
Participation Status								
Participation	4	211.3	37.14	692.3	16.32	687.6		
							0.44	.5227
Nonparticipation	9	202.9	36.82	678.3	39.11	680.4		
				Homogeneity of Regression			4.41	.0652
				Total Reading				
Participation Status								
Participation	4	231.3	25.75	681.2	8.58	681.2		
							0.06	.8068
Nonparticipation	9	224.0	43.62	678.6	35.74	678.6		
				Homogeneity of Regression			4.73	.0578
				Total Language Arts				
Participation Status								
Participation	4	203.3	28.50	707.8	27.91	707.7a		
							4.82	.0529
Nonparticipation	9	202.9	38.09	681.0	32.61	681.0b		
				Homogeneity of Regression			0.20	.6679
				Total Mathematics				
Participation Status								
Participation	4	209.3	59.28	684.8	32.82	676.7		
							0.02	.8848
Nonparticipation	9	195.7	25.91	677.1	58.84	680.7		
				Homogeneity of Regression			5.00	.0522

(continued)

Table 1 (continued)

Variable	n	Covariant m	Covariant s	Posttest m	Posttest s	Adjusted Posttest m	F value	p level
Fifth Grade				Total Battery				
Participation Status								
Participation	5	238.6	51.40	702.4	55.46	723.0		
							2.82	.1315
Nonparticipation	6	282.8	60.30	723.0	46.12	705.8		
			Homogeneity of Regression				2.23	.1792
				Total Reading				
Participation Status								
Participation	5	252.2	37.02	699.0	44.87	713.6		
							2.84	.1304
Nonparticipation	6	274.8	52.29	702.5	66.93	690.4		
			Homogeneity of Regression				0.03	.8649
				Total Language Arts				
Participation Status								
Participation	5	250.4	49.96	706.0	32.30	722.0		
							0.02	.8791
Nonparticipation	6	301.5	61.41	734.0	35.84	720.7		
			Homogeneity of Regression				0.00	.9898
				Total Mathematics				
Participation Status								
Participation	5	218.2	50.00	703.0	100.17	725.3		
							0.23	.6468
Nonparticipation	6	246.5	39.40	732.8	39.05	714.2		
			Homogeneity of Regression				4.56	.0702

(continued)

Table 1 (continued)

Variable	n	Covariant m	Covariant s	Posttest m	Posttest s	Adjusted Posttest m	F value	p level
Sixth Grade				Total Battery				
Participation Status								
Participation	6	291.5	59.16	733.5	26.00	743.0		
							0.67	.4316
Nonparticipation	7	332.6	93.63	743.7	44.60	735.6		
				Homogeneity of Regression			0.22	.6476
				Total Reading				
Participation Status								
Participation	6	299.7	61.74	707.8	39.66	711.2		
							2.69	.1319
Nonparticipation	7	310.1	69.03	734.3	47.86	731.4		
				Homogeneity of Regression			0.00	.9611
				Total Language Arts				
Participation Status								
Participation	6	286.0	47.54	737.2	21.74	745.0		
							0.60	.4566
Nonparticipation	7	311.6	77.86	737.3	63.36	730.5		
				Homogeneity of Regression			2.24	.1690
				Total Mathematics				
Participation Status								
Participation	6	256.5	40.90	756.2	24.39	767.8		
							2.56	.1406
Nonparticipation	7	300.4	54.48	760.0	32.89	750.1		
				Homogeneity of Regression			0.51	.4944

ab Difference statistically significant at the .05 level according to least sums of squares test of means.

One of the 16 p values was statistically significant at the .05 level; therefore, the null hypothesis for this comparison was rejected. The statistically significant comparison was for sixth grade participation status for the dependent variable Total Language Arts. The results cited in Table 1 indicated that those who participated in the hot breakfast program did statistically better in Total Language Arts than those who did not participate. The assumption of homogeneity of regression was met for all comparisons except fourth grade Total Mathematics.

It was hypothesized in composite null hypothesis number two that the difference between the adjusted posttest mean Comprehensive Tests of Basic Skills scores for those who participated in a hot breakfast program (with SRA Survey of Basic Skills scores as the covariant measure) according to economic status would not be statistically significant. Table 2 contains information pertaining to composite null hypothesis number two. The following were cited in Table 2: variable, group sizes, covariant means, covariant standard deviations, posttest means, posttest standard deviations, adjusted posttest means, F values, and p levels.

Table 2: A Comparison of Adjusted Posttest Mean Comprehensive Test of Basic Skills Scores with SRA Survey of Basic Skills Scores as the Covariant Measure for Those Who Participated in a Hot Breakfast Program According to Economic Status Employing Single-Factor Analysis of Covariance.

Variable	n	Covariant m	Covariant s	Posttest m	Posttest s	Adjusted Posttest m	F value	p level
Second Grade				Total Battery				
Economic Status								
Full price for breakfast	4	195.5	65.96	664.0	46.31	656.4		
							0.45	.5310
Reduced price or free breakfast	4	177.5	32.23	660.0	51.05	667.6		
			Homogeneity of Regression				5.58	.0776
				Total Reading				
Economic Status								
Full price for breakfast	4	205.8	60.67	665.0	43.78	651.6		
							0.42	.5466
Reduced price or free breakfast	4	178.0	24.03	662.0	78.31	675.4		
			Homogeneity of Regression				9.94	.0344
				Total Language Arts				
Economic Status								
Full price for breakfast	4	198.3	67.94	701.0	46.46	694.4		
							2.16	.2018
Reduced price or free breakfast	4	176.5	33.79	661.2	31.40	667.8		
			Homogeneity of Regression				0.16	.7089
				Total Mathematics				
Economic Status								
Full price for breakfast	4	201.3	49.73	626.8	56.40	624.5		
							6.94	.0463
Reduced price or free breakfast	4	197.0	41.75	657.3	45.55	659.5		
			Homogeneity of Regression				0.07	.8019

(continued)

Table 2 (continued)

Variable	n	Covariant m	Covariant s	Posttest m	Posttest s	Adjusted Posttest m	F value	p level
Fifth Grade				Total Battery				
Economic Status								
Full price for breakfast	2	218.0	84.85	676.5	79.90	696.8		
							0.15	.7325
Reduced price or free breakfast	3	252.3	31.26	719.7	42.90	706.1		
			Homogeneity of Regression				0.06	.8493
				Total Reading				
Economic Status								
Full price for breakfast	2	242.0	56.57	693.0	53.74	704.9		
							0.24	.6752
Reduced price or free breakfast	3	259.0	31.10	703.0	50.23	695.1		
			Homogeneity of Regression				0.78	.5403
				Total Language Arts				
Economic Status								
Full price for breakfast	2	231.5	72.83	696.5	31.82	707.5		
							0.01	.9165
Reduced price or free breakfast	3	263.0	41.76	712.3	37.82	705.0		
			Homogeneity of Regression				0.44	.7363
				Total Mathematics				
Economic Status								
Full price for breakfast	2	193.0	86.27	641.0	154.15	684.3		
							0.45	.5716
Reduced price or free breakfast	3	235.0	14.80	744.3	42.19	715.5		
			Homogeneity of Regression				0.19	.7363

None of the 8 p values was statistically significant at the .05 level; therefore, the null hypotheses for these comparisons were retained . The results cited in Table 2 indicated no association between independent and dependent variables. The assumption of homogeneity of regression was met for all comparisons except for second grade for the dependent variable Total Reading.

It was hypothesized in composite null hypothesis number three that the difference between the adjusted posttest mean Comprehensive Tests of Basic Skill scores for those who participated in a hot breakfast program (with SRA Survey of Basic Skills scores as the covariant measure) according to gender would not be statistically significant. Table 3 contains information pertaining to composite null hypothesis number three. The following were cited in Table 3: variable, group sizes, covariant means, covariant standard deviations, posttest means, posttest standard deviations, adjusted posttest means, F values, and p levels.

Table 3: A Comparison of Adjusted Posttest Mean Comprehensive Test of Basic Skills Scores with SRA Survey of Basic Skills Scores as the Covariant Measure for Those Who Participated in a Hot Breakfast Program According to Gender Employing Single-Factor Analysis of Covariance.

Variable	n	Covariant m	Covariant s	Posttest m	Posttest s	Adjusted Posttest m	F value	p level
Second Grade				Total Battery				
Gender								
Female	4	193.3	62.15	680.3	51.32	675.0		
							4.12	.0982
Male	4	179.8	40.27	643.8	35.20	649.0		
				Homogeneity of Regression			0.11	.7546
				Total Reading				
Gender								
Female	4	205.0	54.75	686.5	66.49	676.2		
							0.49	.5161
Male	4	178.8	36.24	640.5	47.16	650.8		
				Homogeneity of Regression			0.54	.5024
				Total Language Arts				
Gender								
Female	4	190.0	59.96	697.8	50.87	696.0		
							3.32	.1280
Male	4	184.8	49.59	664.5	29.55	666.2		
				Homogeneity of Regression			1.41	.3011
				Total Mathematics				
Gender								
Female	4	204.5	56.10	657.3	55.40	651.9		
							1.12	.3377
Male	4	193.8	31.69	626.8	46.76	632.1		
				Homogeneity of Regression			0.70	.4503

(continued)

Table 3 (continued)

Variable	n	Covariant m	Covariant s	Posttest m	Posttest s	Adjusted Posttest m	F value	p level
Sixth Grade				Total Battery				
Gender								
Female	2	231.5	12.02	706.0	9.90	721.0		
							0.78	.4413
Male	4	321.5	46.74	747.3	18.36	739.8		
			Homogeneity of Regression				0.65	.5047
				Total Reading				
Gender								
Female	2	232.0	5.66	661.0	25.46	685.3		
							2.13	.2403
Male	4	333.5	42.00	731.3	14.57	719.1		
			Homogeneity of Regression				22.86	.0411
				Total Language Arts				
Gender								
Female	2	241.5	30.41	719.5	19.09	717.7		
							1.14	.3648
Male	4	308.3	38.45	746.0	18.81	746.9		
			Homogeneity of Regression				0.75	.4777
				Total Mathematics				
Gender								
Female	2	231.0	12.73	737.5	14.85	744.2		
							0.66	.4747
Male	4	269.3	45.65	765.5	23.87	762.1		
			Homogeneity of Regression				0.20	.6978

None of the 8 p values was statistically significant at the .05 level; therefore, the null hypotheses for these comparisons were retained. The results cited in Table 3 indicated no association between independent and dependent variables. The assumption of homogeneity of regression was met for all comparisons except for sixth grade for the dependent variable Total Reading.

It was hypothesized in composite null hypothesis number four that the difference between the adjusted posttest mean Comprehensive Tests of Basic Skill scores for those who participated in a hot breakfast program (with SRA Survey of Basic Skills scores as the covariant measure) according to Chapter I reading participation status would not be statistically significant. Table 4 contains information pertaining to composite null hypothesis number four. The following were cited in Table 4: variable, group sizes, covariant means, covariant standard deviations, posttest means, posttest standard deviations, adjusted posttest means, F values, and p levels.

Table 4: A Comparison of Adjusted Posttest Mean Comprehensive Test of Basic Skills Scores with SRA Survey of Basic Skills Scores as the Covariant Measure for Those Who Participated in a Hot Breakfast Program According to Chapter I Reading Status Employing Single-Factor Analysis of Covariance.

Variable	n	Covariant m	Covariant s	Posttest m	Posttest s	Adjusted Posttest m	F value	p level
Second Grade				Total Battery				
Chapter I Reading Status								
Nonparticipation	5	207.8	49.58	681.0	48.10	664.3		
							0.08	.7878
Participation	3	151.0	21.66	630.3	10.41	658.1		
			Homogeneity of Regression				0.24	.6491
				Total Reading				
Chapter I Reading Status								
Nonparticipation	5	212.8	45.66	686.2	65.70	670.9		
							0.17	.6980
Participation	3	157.0	8.19	625.7	4.04	651.2		
			Homogeneity of Regression				0.05	.8284
				Total Language Arts				
Chapter I Reading Status								
Nonparticipation	5	210.2	51.60	693.8	49.99	676.9		
							0.17	.6985
Participation	3	149.3	17.62	660.0	15.10	688.1		
			Homogeneity of Regression				1.75	.2561
				Total Mathematics				
Chapter I Reading Status								
Nonparticipation	5	214.2	45.30	664.0	40.85	650.5		
							1.07	.3492
Participation	3	174.0	26.91	605.3	47.44	627.8		
			Homogeneity of Regression				1.19	.3369

(continued)

Table 4 (continued)

Variable	n	Covariant m	Covariant s	Posttest m	Posttest s	Adjustea Posttest m	F value	p level
Sixth Grade				Total Battery				
Chapter I Reading Status								
Nonparticipation	4	321.5	46.74	747.3	18.36	739.8		
							0.78	.4413
Participation	2	231.5	12.02	706.0	9.90	721.0		
			Homogeneity of Regression				0.65	.5047
				Total Reading				
Chapter I Reading Status								
Nonparticipation	4	333.5	42.00	731.3	14.57	719.1		
							2.13	.2403
Participation	2	232.0	5.66	661.0	25.46	685.3		
			Homogeneity of Regression				22.86	.0411
				Total Language Arts				
Chapter I Reading Status								
Nonparticipation	4	308.3	38.45	746.0	18.81	746.9		
							1.14	.3648
Participation	2	241.5	30.41	719.5	19.09	717.7		
			Homogeneity of Regression				0.75	.4777
				Total Mathematics				
Chapter I Reading Status								
Nonparticipation	4	269.3	45.66	765.5	23.87	762.2		
							0.66	.4747
Participation	2	231.0	12.73	737.5	14.85	744.2		
			Homogeneity of Regression				0.20	.6978

None of the 8 p values was statistically significant at the .05 level; therefore, the null hypotheses for these comparison were retained. The results cited in Table 4 indicated no association between independent and dependent variables. The assumption of homogeneity of regression was met for all comparisons except sixth grade for the dependent variable for Total Reading.

It was hypothesized in composite null hypothesis number five that the difference between the adjusted posttest mean Comprehensive Test of Basic Skills scores for those who participated in a hot breakfast program (with SRA Survey of Basic Skills scores as the covariant measure) according to race would not be statistically significant. Table 5 contains information pertaining to composite null hypothesis number five. The following were cited in Table 5: variable, group sizes, covariant means, covariant standard deviations, posttest means, posttest standard deviations, adjusted posttest means, F values, and p levels.

Table 5: A Comparison of Adjusted Posttest Mean Comprehensive Test of Basic Skills Scores with SRA Survey of Basic Skills Scores as the Covariant Measure for Those Who Participated in a Hot Breakfast Program According to Race Employing Single-Factor Analysis of Covariance.

Variable	n	Covariant m	Covariant s	Posttest m	Posttest s	Adjusted Posttest m	F value	p level
Sixth Grade				Total Battery				
Race								
Caucasian	4	272.3	56.35	731.0	31.58	739.9		
							2.18	.2361
Minorities	2	330.0	59.40	738.5	17.68	720.7		
				Homogeneity of Regression			0.71	.4890
				Total Reading				
Race								
Caucasian	4	296.0	75.75	700.0	47.48	702.2		
							1.79	.2728
Minorities	2	307.0	41.01	723.5	19.09	719.2		
				Homogeneity of Regression			0.09	.7961
				Total Language Arts				
Race								
Caucasian	4	260.5	30.82	735.3	26.81	746.6		
							0.61	.4902
Minorities	2	337.0	25.46	741.0	12.73	718.2		
				Homogeneity of Regression			0.00	.9624
				Total Mathematics				
Race								
Caucasian	4	242.3	32.60	758.0	28.95	766.2		
							2.72	.1979
Minorities	2	285.0	52.33	752.5	20.51	736.0		
				Homogeneity of Regression			0.46	.5694

None of the 4 p values was statistically significant at the .05 level; therefore, the null hypotheses for these comparisons were retained. The results cited in Table 5 indicated no association between independent and dependent variables. The assumption of homogeneity of regression was met for all comparisons.

It was hypothesized in composite null hypothesis number six that the difference between the adjusted posttest mean number of absences (with absenteeism for the previous year as the covariant measure) according to participation status in a hot breakfast program would not be statistically significant. Table 6 contains information pertaining to composite null hypothesis number six. The following were cited in Table 6: variable, group sizes, covariant means, covariant standard deviations, posttest means, posttest standard deviations, adjusted posttest means, F values, and p levels.

Table 6: A Comparison of Adjusted Posttest Mean Number of Absences with Absenteeism for the Previous Year as the Covariant Measure According to Participation Status Employing Single-Factor Analysis of Covariance.

Variable	n	Covariant m	Covariant s	Posttest m	Posttest s	Adjusted Posttest m	F value	p level
Second Grade			Total Number of Absence					
Participation Status								
Participation	8	4.3	4.74	3.3	3.96	3.2	0.19	.6693
Nonparticipation	8	6.1	3.76	4.1	3.52	4.1		
			Homogeneity of Regression				3.14	.1018
Fourth Grade			Total Number of Absence					
Participation Status								
Participation	4	11.0	11.60	8.5	9.11	6.7	0.26	.6229
Nonparticipation	9	6.3	6.40	7.7	5.66	8.4		
			Homogeneity of Regression				0.20	.6657
Fifth Grade			Total Number of Absence					
Participation Status								
Participation	5	5.2	3.42	2.8	1.30	3.3	2.96	.1239
Nonparticipation	6	8.3	10.37	9.8	3.04	9.3		
			Homogeneity of Regression				0.06	.8074
Sixth Grade			Total Number of Absence					
Participation Status								
Participation	6	3.8	5.00	6.2	2.04	6.2	15.82	.0026
Nonparticipation	7	5.7	3.20	1.4	2.07	1.4		
			Homogeneity of Regression				4.26	.0691

One of the 4 p values was statistically significant at the .05 level; therefore, the null hypothesis for this comparison was rejected. The statistically significant comparison was for the independent variable participation for total number of absences for sixth grade. The results cited in Table 6 indicated that those who participated had statistically more absenteeism than those who did not participate. The assumption of homogeneity of regression was met for all comparisons.

It was hypothesized in composite null hypothesis number seven that the difference between the adjusted posttest mean number of times tardy (with tardiness for the previous year as the covariant measure) according to participation status in a hot breakfast program would not be statistically significant. Table 7 contains information pertaining to composite null hypothesis number seven. The following were cited in Table 7: variable, group sizes, covariant means, covariant standard deviations, posttest means, posttest standard deviations, adjusted posttest means, F values, and p levels.

Table 7: A Comparison of Adjusted Posttest Mean Number of Times Tardiy with Tardiness for the Previous Year as the Covariant Measure According to Participation Status Employing Single-Factor Analysis of Covariance.

Variable	n	Covariant m	Covariant s	Posttest m	Posttest s	Adjusted Posttest m	F value	p level
Second Grade			Total Number of Tardy					
Participation Status								
Participation	8	1.9	2.64	0.0	0.00	0.8		
							1.71	.2139
Nonparticipation	8	6.3	8.84	2.9	4.22	2.1		
			Homogeneity of Regression				2.65	.1298
Fourth Grade			Total Number of Tardy					
Participation Status								
Participation	4	0.8	1.50	1.3	1.89	1.2		
							1.59	.2355
Nonparticipation	9	2.3	3.71	0.3	0.50	0.3		
			Homogeneity of Regression				0.04	.8476
Sixth Grade			Total Number of Tardy					
Participation Status								
Participation	6	5.3	8.82	1.7	3.20	1.5		
							0.52	.4882
Nonparticipation	7	0.4	0.53	0.3	0.49	0.5		
			Homogeneity of Regression				0.11	.7526

None of the 3 p values was statistically significant at the .05 level; therefore, the null hypotheses for these comparisons were retained. The results cited in Table 7 indicated no association between the independent (participation status) and the dependent (number of times tardy) variables. The assumption of homogeneity of regression was met for all comparisons.

Discussion

The purpose of the researcher was to investigate a hot breakfast program. The independent variables were participation status, economic status, gender, Chapter I reading status, and race. The dependent variables were Total Battery, Total Reading, Total Language Arts and Total Mathematics scores from the Comprehensive Tests of Basic Skills, total number of absences and total number of times tardy. Scores from the Survey of Basic Skills (SRA scores) were employed as covariant measures (composite null hypotheses one through five, number of absences for previous year for composite null six, and total number of times tardy for previous year for composite null seven). The sample consisted of 53 subjects from two elementary schools. The experimental group consisted of 23 students from the second, fourth, fifth, and sixth grades. The control group consisted of 30 students from the second, fourth, fifth, and sixth grades. Seven composite null hypotheses were tested at the .05 level of significance employing a single-factor analysis of covariance.

A total of 31 comparisons were tested. All 31 comparisons were main effects. Two of the 31 comparisons were statistically significant at the .05 level. The statistically significant main effects were for the following: sixth grade for the independent variable participation status and the dependent variable Total Language Arts; and sixth grade for the independent variable participation status and the dependent variable of absences. The significant comparisons indicated the following: sixth grade students who participated in the hot breakfast program had statistically significant higher achievement in Total Language Arts than those who did not participate; and sixth grade students who participated had statistically significant more absences than those who did not participate.

The result of the present study supported the findings of Meyers, Sampson, Weitzman, Kayne (1989) that students who participated in a school

hot breakfast program showed a greater increase in achievement test scores than students who did not participate.

The results of the present study did not support the findings of Meyers et al (1989) who reported that participation in a school hot breakfast program was associated with decreased rates of tardiness. There was little difference between rates of tardiness between students who participated or did not participate in the hot breakfast program.

The results of the present study appeared to support the following generalizations:

1) an association between participation in a hot breakfast program and achievement test scores for sixth graders in Total Language Arts,

2) an association between participation in a hot breakfast program and absenteeism rates for sixth grade,

3) no association between participation in a hot breakfast program according to economic status and achievement test scores,

4) no association between participation in a hot breakfast program according to gender and achievement test scores,

5) no association between participation in a hot breakfast program according to Chapter I reading status and achievement test scores,

6) no association between participation in a hot breakfast program according to race and achievement test scores, and

7) no association between participation in a hot breakfast program according to number of times tardy and achievement test scores.

The results of the present study appeared to support the following recommendations:

1) the study should be replicated employing a large random sample,

2) the study should be replicated in more than one school district,

3) the study should be replicated employing the same pretest and posttest,

4) the study should be replicated in more than one geographic area, and

5) the study should be replicated over a longer period of time.

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Appendix A

LETTER TO MRS. ELIZABETH DENNIS

June 5, 1992

Mrs. Elizabeth Dennis
Washington Elementary
2535 Lakin
Great Bend, KS 67530

Dear Mrs. Dennis,

Thank you for allowing me to conduct a study with the second through six grade students at Washington Elementary. I will be using this group as the experimental group in a study to determine the effects of participation in the breakfast program as measured by achievement test scores. The achievement scores will include both the SRA and CTBS. The control group, located at Park Elementary, have not participated in the school breakfast program during the school year 1991-92.

In order for me to keep accurate records of permission that has been granted, I would appreciate your signature at the bottom of this page.

After completion of this study, I would be glad to discuss the results with you.

Thank you again for your support in this study.

Sincerely,

Sheryl Neeland

Sheryl Neeland

I, _____, give permission for this study to determine the effects of participation in the breakfast program as measured by achievement test scores.

Appendix B

LETTER TO MR. DAVID METER

June 5, 1992

Mr. David Meter
Park Elementary
1801 Williams
Great Bend, KS 67530

Dear Mr. Meter,

Thank you for allowing me to conduct a study with the second through six grade students at Park Elementary. I will be using this group as the control group in a study to determine the effects of nonparticipation in the breakfast program as measured by achievement test scores. The achievement scores will include both the SRA and CTBS. The experimental group, located at Washington Elementary, have participated in the school breakfast program during the school year 1991-92.

In order for me to keep accurate records of permission that has been granted, I would appreciate your signature at the bottom of this page.

After completion of this study, I would be glad to discuss the results with you.

Thank you again for your support in this study.

Sincerely,

Sheryl Neeland

Sheryl Neeland

I, Dan Meter, Principal, give permission for this study to determine the effects of nonparticipation in the breakfast program as measured by achievement test scores.

Appendix C

LETTER FROM KANSAS STATE DEPARTMENT OF EDUCATION

Kansas State Board of Education
120 S.E. 10th Avenue, Topeka, Kansas 66612-1182

February 6, 1991

TO: Superintendents

FROM: Rita Hamman, Director
School Food Service

RE: **SCHOOL BREAKFAST PROGRAM START-UP GRANT**

Proper nutrition is instrumental in a child's ability to learn. Research indicates that children who receive good nutritious meals will do better in school and have higher achievement levels. Breakfast can play an important part in a child's ability to learn. In addition, we are eager to help districts establish new breakfast programs because school breakfast participation in Kansas ranks 51st among other states and U.S. territories.

The Child Nutrition and WIC Reauthorization Act of 1989 (Public Law 101-147) provides funds for the initiation of School Breakfast Programs. The five year grant was established to provide funds to cover nonrecurring expenses of starting a School Breakfast Program (SBP). The Kansas State Department of Education was awarded $95,000 for fiscal year 1990 and $179,000 for fiscal year 1991.

It is now time to apply for the fiscal year 1992 School Breakfast Program Start-up Grant. The grant application will be submitted by KSDE on behalf of eligible schools. While grant funds will not be available until October 1991, the grant can be used for breakfast programs which begin in September 1991. THE GRANT CANNOT BE USED FOR BREAKFAST PROGRAMS WHICH STARTED PRIOR TO SEPTEMBER 1991.

The first step of the grant application process is to identify those schools which are interested in and qualify for the grant funds. An eligible school is a school attended by a significant percentage of children from low-income families and one which agrees to operate the SBP for at least three years.

The conditions of the grant award include:

- Start-up funds must be used for nonrecurring costs only. Nonrecurring costs include equipment, training of staff, outreach efforts to publicize new SBP, etc.

OVER

•Only eligible schools will receive start-up grant funds. Eligible schools have been identified by the Kansas State Department of Education as those which have 30 percent or more free and reduced price students eligible, or schools which can provide other reasons which address the need for a breakfast program.

•Schools must agree to operate the SBP for at least three years from the date they begin the breakfast program.

•Current expenditures of local funds for the expansion or maintenance of SBPs shall not be diminished as a result of receipt of start-up funds.

•Schools which receive funds under the SBP start-up grants will report on the newly established breakfast program and use of the start-up funds quarterly.

•Grant funds must be obligated by September 30, 1992. Grant funds should be available in October 1991.

The Start-up Grant **CANNOT** be used for:

•the salaries and benefits of permanent staff (except for work performed in relation to the start-up grant),

•food,

•any other recurring costs,

•the expansion of existing breakfast program services, or

•outreach to increase student participation in existing SBP.

A request form is being sent to School Food Service Authorized Representatives. All school food authorities wishing to receive a grant application for the FY 1992 grant proposal must complete the form and return it to the School Food Service Section or call and request an application. Completed grant applications are due to KSDE by March 15, 1991. The KSDE proposal must be submitted to the U.S. Department of Agriculture by April 1, 1991.