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DISSERTATION

FIRST-YEAR COLLEGE PERFORMANCE: A STUDY OF HOME-SCHOOLED GRADUATES AND TRADITIONAL HIGH SCHOOL GRADUATES

Submitted by

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School of Education

In partial fulfillment of the requirements

For the Degree of Doctor of Philosophy

Colorado State University

Fort Collins, Colorado

Summer 2002

COLORADO STATE UNIVERSITY

April 15, 2002

WE HEREBY RECOMMEND THAT THE DISSERTATION PREPARED UNDER OUR SUPERVISION BY PAUL ANTHONY JONES ENTITLED FIRST-YEAR COLLEGE PERFORMANCE: A STUDY OF HOME-SCHOOLED GRADUATES AND TRADITIONAL HIGH SCHOOL GRADUATES BE ACCEPTED AS FULFILLING IN PART REQUIREMENT FOR THE DEGREE OF DOCTOR OF PHILOSOPHY.

Committee on Graduate Work

Adviser

Department Head

ABSTRACT OF DISSERTATION

FIRST-YEAR COLLEGE PERFORMANCE: A STUDY OF HOME-SCHOOLED GRADUATES AND TRADITIONAL HIGH SCHOOL GRADUATES

The purpose of this study was to determine if there were differences in first-year academic performance between home-schooled and traditional high school graduates in college measured by grade point average, retention, ACT test scores, and credits earned in their first year of college. Additionally, the study examined the attitudes and perceptions of admission personnel toward the home-schooled graduate.

A total of 55 home-schooled graduates and 53 traditional high school graduates were examined in the first phase of the study. No significant differences were found between home-schooled and traditional high school graduates in first-year grade point average, retention, ACT test scores, or credits earned in the first year of college, but the home-schooled graduates were somewhat higher on all of these measures. A significant correlation was found between ACT Composite test scores and retention, cumulative grade point average, and cumulative credits earned.

The second phase of the study included 55 four-year admissions officers from the Western United States. The findings of this study revealed that nearly 75% of the colleges and universities had an official home school admissions policy. The ACT or SAT test was the most preferred item utilized for consideration for admission followed by an essay or GED test score. More than 55% of the admission officers expected home-

schooled graduates to perform about the same as traditional high school graduates on overall first-year success rate, cumulative grade point average, retention rate, credit hours earned, and coping socially in their first year of college.

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CHAPTER I

INTRODUCTION

Background

Parents choosing to home school their children are not new to the American society. During the Colonial Period American families, from the wealthy to the poor, educated their children at home (Hill, 2000; Knowles, Marlow, & Muchmore, 1992). During the past three decades, the number of families choosing to exercise their legal option to educate their children at home rather than enroll them in public schools has increasingly grown throughout the United States (Mayberry, Knowles, Ray, & Marlow, 1995; Osborn, 2000; Ray, 2000). According to recent estimates, the home school K-12 population is estimated as high as 1.6 million students nationwide and is expected to grow nearly seven percent annually, which would reach three million by the year 2010 (Lines, 1996; Ray, 1999).

During this period of growth, while state policy makers and school boards have been faced with challenges to the compulsory regulations by home school advocates, many colleges and universities have been relatively left alone. Admissions officers across the United States have been trying to grapple with how to address a growing population of the newly graduated home-schooled student that is knocking at their door for admission.

Presently, very little is known about the performance of a home-schooled graduate's academic performance in college. Although very little is known about home-schooled graduates in college, this has not shielded colleges and universities from developing admission policies (accommodating or unaccommodating) toward the home school population. Much of the research on academic performance has centered on K-12 home-schooled students. Recent empirical studies (Galloway, 1995; Gray, 1998; Jenkins, 1998) have been just a few of the studies that have specifically focused on the first-year academic performance of the home-schooled college student.

In Colorado, gaining admission to a four-year college or university requires new freshmen students to meet a prescribed legislative admission index. The Colorado four-year admission criteria was established by Colorado House Bill 85-1187 (1987) and implemented in 1987 by the Colorado Commission on Higher Education (CCHE). The admission index, which is a performance-based matrix, is calculated on a student's cumulative high school grade point average or class-rank (whichever is higher) and scores from the American College Testing (ACT) or Scholastic Aptitude Test (SAT) test. Students may also be admitted using the General Educational Development exam scores (GED). Students who do not meet the institution's minimum admission index score may be admitted into the college's or university's 20% admission "Window". The Window was designed to allow institutions to admit students who do not meet their regular admission standards, but have potential for success. The current admission Window policy encourages institutions to utilize the Window for minority students, students with special talents, and students with disabilities. Because an admissions index cannot be computed (there is no valid class rank and high school grade point average) for home-

schooled students, any four-year college or university who admits a home-schooled student to their institution must admit them into their Window. To avoid using this valuable space, some institutions require the home-educated student to obtain a General Educational Development (GED), which than exempts the home-schooled graduate from the window. While home-schooled students are not mentioned in the admission policy, students from foreign countries and returning adults do not count in the Window. In 1995, Colorado introduced a new act Concerning Academic Admission Standards for Institutions of Higher Education Act (1996) to help accommodate increased student demand for access to higher education and to accommodate students who were graduating from high schools using performance-based transcripts {portfolio}. The home-schooled student continues to be excluded from the policy.

One of the problems for institutions of higher education and state policy makers is the lack of empirical studies conducted to examine the performance of home-schooled students in college. In Colorado, like many other states, there has been little research that examines performance outcomes of the home-educated student, while some policy makers and admissions officers continue policies and standards that are unfavorable to this student population (O'Neill, 2001; Tarricone, 1997).

Statement of the Problem

Public college and university admissions officers continue to debate the viability of home education while struggling with the issue of how to evaluate documents from home-schooled applicants. For state policy makers, home school advocates continue to challenge states in court or out of court with the issue of access for the home educated. Therefore, the purpose of this study is to determine if there is a difference between the

first-year academic performance of home-schooled and traditional high school graduates in college measured by grade point average, retention, ACT test scores, and credits earned in their first year of college. Additionally, the study examines the attitudes and perceptions of admission personnel toward the home-schooled graduate.

Null Hypotheses

To accomplish the stated purpose of the study, nine hypotheses were tested to determine differences between home-schooled graduates and traditional high school graduates?

Hypothesis one. There is no significant difference in first-year grade point averages between home-schooled and traditional high school graduates.

Hypothesis two. There is no significant difference between home-schooled graduates and traditional high school graduates on whether they are retained in college during their first-year (fall to spring semester).

Hypothesis three. There is no significant difference in first-year credit hours earned between home-schooled and traditional high school graduates.

Hypothesis four. There is no significant difference in the ACT Composite scores between home-schooled and traditional high school graduates.

Hypothesis five. There is no significant difference in the ACT English test scores between home-schooled and traditional high school graduates.

Hypothesis six. There is no significant difference in the ACT Mathematics test scores between home-schooled and traditional high school graduates.

Hypothesis seven. There is no significant difference in the ACT Reading test scores between home-schooled and traditional high school graduates.

Hypothesis eight. There is no significant difference in the ACT Science Reasoning test scores between home-schooled and traditional high school graduates.

Hypothesis nine. There is no correlation between the following variables: first-year grade point average, first-year earned credit hours, first-year retention, and the ACT Composite test score.

Research Questions

The second phase of the study surveyed admissions officers and focused on the following two research questions:

Research Question 1: What are the college admissions policies for home school applicants?

Research Question 2: What are the attitudes and perceptions of admissions personnel toward the home-schooled graduate population?

Definition of Terms

Academic Performance

For the purpose of this study, academic performance refers to first-year grade point average, college credit hours earned, and student retention.

Admissions officers

Used in this study, this term refers to the chief admission officer responsible for the admission of undergraduate students to each institution.

Admission Index

Refers to the Colorado calculated admission matrix, which includes grade point average, test scores, or class rank, for the purpose of admission to four-year colleges.

Carnegie Classification

Refers to the 2000 Carnegie classification of accredited colleges and universities in the United States based on the degree-granting activities from 1995-96 through 1997-98 (The Carnegie Classification of Institutions of Higher Education, 2002).

Community College

Refers to a public two-year junior college, community college, or technical school.

First-year Student

Refers to a student who is attending college for the first time as a degree-seeking student.

Home Educated

Refers to a process where a student receives their primary education in their permanent dwelling (synonymous with home-schooled or home schooling).

Home School

Refers to the location where the primary academic instruction takes place.

Home School Graduate

Where a student receives their high school diploma or where high school was completed.

Minority Student

Refers to a student who is from an African-American, American Indian, Asian or Pacific Islander, Hispanic, or mixed racial heritage.

Returning Student

Refers to an adult student who is 21 or older returning to college for the first time.

Traditional High School Graduate

A general term used to refer to graduates from public, private, or parochial schools.

Window

Refers to the Colorado exception policy to the admission index, which allows institutions to admit students that do not meet regular admission standards.

Limitations and Assumptions

This study was limited to the data provided from the Colorado Commission on Higher Education on first-year home-schooled graduates and traditional high school graduates who enrolled in four-year colleges and universities in Colorado during the 1998-2000 summer and fall semesters. Although the Colorado Commission on Higher Education implemented a new high school code for home-schooled students, limited data were available for home-schooled graduates. Some of the unavailability of home-schooled data on students may be due to erroneous coding of the home-schooled graduate by college admissions officers, and some students may be categorized in the GED or other categories due to individual institution's admission policies.

Delimitation

The study was delimited to first-year enrolled home-schooled and traditional high school graduates in four-year Colorado public colleges and universities. Additionally, survey responses were delimited to members of the Hawaii Association for College Admission Counseling (HACAC), Pacific Northwest Association for College Admission Counseling (PNACAC), Rocky Mountain Association for College Admission Counseling (RMACAC), and Western Association for College Admission Counseling (WACAC). These organizations represent approximately 471 two-year and four-year institutions in

the United States and are part of the National Association for College Admission Counseling.

Significance of the Study

In their studies, both Gray (1998) & Jenkins (1998) recommended that further study is needed on the academic performance of home school graduates in college.

A study on the academic performance of the home-schooled graduate is important for several reasons. First, since there appears to be no slowing down of this movement, understanding the academic performance of home-educated students while in college and understanding the perceptions of college admissions personnel toward the home school graduate will provide much needed information for state policy makers and admission personnel on how these students perform compared to their traditionally schooled peers. Second, providing academic performance information on home-schooled graduates in four-year colleges and universities will provide useful information to researchers, home school advocates, policy makers, and admission personnel. Third, researchers have almost exclusively studied the academic performance of home school graduates at the K-12 level; therefore, this study will help fill an important "gap" in the literature, that is what happened to the home-schooled students at the college level. Fourth, families who are thinking about the option of exercising their right to home educate will gain more knowledge on the academic performance of home school graduates in college to better inform their decision.

The Researcher's Background

In developing a conceptual framework for this study, I have attempted to be very careful of the bias that I may have due to my friendships with families of home school children in western Colorado.

I have been a college administrator in student affairs and enrollment management for nearly 16 years. Most of these years have been served in admissions. It has been within the past five years that I have become interested and intrigued with the home school movement. During the mid-1990s, the parents of home-schooled children helped me become interested in this topic. Their early challenges to our admission policies of requiring the home school graduate to earn a GED for consideration of admissions were the impetus for this study. When asked about this policy, my only response to the parents of the home educated was that it was policy. Because of my plight as an African American and the plight of others who have been traditionally under-represented in education, I was sensitive to fact that this might be another form of discrimination. Therefore, I felt an obligation to review the literature and research this issue. During the past year, I have also gained interest from at least one Colorado Commission on Higher Education staff member who is interested in the results of this study and requested that I serve on the CCHE Admissions Committee.

CHAPTER II

REVIEW OF RELATED LITERATURE

Introduction

While the recent growth of home schooling in America may not be an overall threat to public education in America today, some school districts are reporting that they are experiencing declines in their enrollments, which ultimately means a loss of revenue to their school districts (Hetzner, 2000; Vater, 2001). The home school population is estimated to be growing at a rate of 7-15 percent annually. The home-educated population is now expected to be the size of the public school population in Los Angeles and Chicago combined (Hill, 2000).

The focus of this study is to determine if there is a difference between the first-year academic performance of home-schooled and traditional high school graduates in college measured by grade point average, retention, ACT test scores, and credits earned in their first year of college. Additionally, the study examines the attitudes and perceptions of admission personnel toward the home-schooled graduate.

This review of literature is organized into three categories. First, studies related to the history and characteristics and demographics will be reviewed. Second, literature related to college admission will be reviewed. Third, studies related the academic achievement and performance of home-schooled students in K-12 and post-secondary education will be examined.

Historical Issues in Home Schooling

Historical Perspective

Before compulsory attendance laws became statutes in all states by the early 1900s, home education was practiced in many American homes. During the seventeenth and eighteenth centuries, parents and others were acting as tutors and educators for their children in their homes. According to Knowles, Muchmore, & Spaulding (1994) in the Native American culture, "Learning from elders through example was typically the only way in which Native American children were educated, and in such environments, education was viewed as being inseparable from life" (Knowles et al., 1994, p. 239). Some notable home schoolers include William Penn, John Quincy Adams, Abraham Lincoln, Woodrow Wilson, Franklin D. Roosevelt, Agatha Christie, Pearl Buck (Moore & Moore, 1982) General Douglas MacArthur, Charles Dickens, Andrew Carnegie, and Mark Twain (Gorder, 1987).

Once compulsory attendance laws became law, the population of home education not only was reduced, but was either illegal in many states or seen as a tremendous controversy. Families home schooling their children in the United States resurfaced as a viable alternative during the late 1960s and early 1970s (Knowles et al., 1994). Many families now electing to home school their children were either dissatisfied with public education or were being influenced by the writings of John Holt who was known as one of the biggest critics of public education. In the book *Underachieving Schools*, Holt (1969) wrote:

> What young people need and want to get from their education is: one, a greater understanding of the world around them; two, a greater development of themselves; three, a chance to find their work, that is, a way in which they may

use their own unique tastes and talents to grapple with the real problems of the world around them and to serve the cause of humanity (p.4).

Holt then added, that:

> Our society asks schools to do three things for and to children: one, pass on the traditions and higher values of our own culture; two, acquaint the child with the world in which he lives; three, prepare the child for employment and, if possible, success. All of these tasks have traditionally been done by the society, the community itself. None of them is done well by schools. None of them can or ought to be done by the schools solely or exclusively. One reason the schools are in trouble is that they have been given too many functions that are not properly or exclusively theirs (p. 4).

Reasons and Motivational Issues for Home Schooling

Parents' reasons for choosing to home school their children have changed throughout history. Gorder (1987) in the book *Home Schools: An Alternative* stated that families, who chose to home school, chose home schooling primarily for religious reasons. However, it was pointed out that families often cited social, academic, moral, and psychological, as other reasons for home schooling and that "each family has their own value system and their own reasons for home schooling. They cannot be lumped together in one category" (Gorder, 1987, p. 14).

Val Galen & Pitman (1991) provided the most comprehensive and most well-used reasons by researchers for parent's motivations for home schooling in the categorization of "ideologues" and "pedagogues". In this study, Val Galen & Pitman conducted a qualitative study during the late 1980s where 23 home school families were interviewed in the southeast over 18 months with the purpose to examine and document the values and beliefs of parents who teach their children at home. In this study, all parents were graduates of high school and several had attended some college.

Val Galen & Pitman results found that the parents of home schoolers could be categorized into two categories. These categories were either "ideologues" or "pedagogues". Ideologues were largely parents of Christian fundamentalist families and were parents who were concerned that their children learn "Christian doctrine" as well as understand that the "family is the most important institution in society" (Val Galen & Pitman, 1991, p. 67). Ideologues adamantly believe that it is their responsibility and right and not the school's responsibility to teach their children. Families who were categorized as "pedagogues" were described as those who taught for pedagogical reasons. These families believed that the schools were inept for their children. Furthermore, Val Galen & Pitman stated that these families placed a strong value on personal independence.

Val Galen & Pitman (1991) described the pedagogue's belief in independence this way:

> This independence is manifested in different ways in different families: In some families, the babies are born at home; other families raise much of their own food. Several of the Christian families in this group belonged to small, nondenominational, loosely organized fellowship rather than to established churches. Home schooling in these families is a powerful symbol of their independence from other social institutions (p. 72).

Val Galen & Pitman also found that pedagogues chose to home school for some of the same reasons as the ideologues. Many of their children had academic problems with conventional schools, while others had not ever enrolled their children in any other school but home school. Pedagogues believed that they have more control and flexibility with their children's curriculum, which allows home school parent-teachers to accommodate the "unique learning" that their child may have. Val Galen & Pitman stated

pedagogues"...believe children will learn naturally and more completely apart from traditional schooling" (p. 73).

Legal Implications Associated with Home Schooling

Today, home schooling is legal in all 50 states. Compulsory attendance laws began in the late 1700s in Massachusetts and became law in all 50 states by the early 1900s (Gorder, 1987). These attendance laws were adopted by states with the idea bringing about education equity to all, not just the wealthy. Compulsory attendance laws typically require children between the ages of six and sixteen to attend school. Although some state compulsory attendance laws require children as young as five and as old as 18 to attend school; in fact, it appears that every year some proponents of compulsory attendance laws challenge the courts to expand the age requirements for children to be schooled. Not surprising, home school advocates are against these compulsory attendance laws, many believing that these laws infringe on their personal and Fourteenth Amendment rights.

Since compulsory attendance laws, home school families have been fighting for the right to legally educate their children at home how and when they wish to. In what has become known as the landmark case, in 1925, *Pierce v. Society of Sisters of the Holy Names of Jesus and Mary* 1925 case, which was the first real challenge to compulsory education. In this case, Oregon voters had voted to enact a much stricter school attendance law that would require not only children to attend school, but this law was to require children of the state of Oregon to attend public schools exclusively. Society of Sisters of the Holy Names of Jesus and Mary appealed this state law because this law would have forbidden children from attending their Catholic school and shut down all

private and non-public schools. In their appeal, the Society of the Sisters of the Holy Names of Jesus and Mary v. Pierce were able to get the District Court to deliver an injunction that delayed the implementation of the law. In granting the injunction, the District Court (1924, 268 U.S. 210) ruled that:

> ...Such schools and their patrons have the same interest in fostering primary education as the state, and appropriate regulation will place them under supervision of school authorities so they will not escape the duty of proper primary instruction. No one has advanced the argument that teaching by these schools is harmful, or that their existence with the privilege of teaching in the grammar grades is a menace, or of vicious potency, to the state or the community at large, and there appears no plausible or sound reason why they should be eliminated from taking part in the primary education of the youth. It would seem that the act in question is neither necessary nor essential for the proper enforcement of the state's school policy (p. 6).

In the appeal, the Supreme Court overturned the Oregon Compulsory Education Act (1925) stating that,

> The statute abridges the freedom of four classes closely interrelated: (1) the freedom of the private and parochial schools, (2) the freedom of teachers engaged in those schools, (3) the freedom of parents and guardians, and (4) the freedom of children. There is nothing in the record which warrants even the suggestion that private and parochial schools in Oregon are in any respect inferior to the public schools. If, however, the contrary were the fact, the case would still be no different; for there would still not exist any valid reason for their total suppression (p. 6).

In 1923 (Meyer v. State of Nebraska), a case was brought against an instructor of a parochial school for violating the law by teaching the German language to a child who had not attained and passed the eighth grade. In an appeal to the Supreme Court, the court reversed the lower courts ruling, stating that:

> ...Mere knowledge of the German language cannot reasonable be regarded as harmful. Heretofore it has been commonly looked upon as helpful and desirable. Plaintiff in error taught this language in school as part of his occupation. His right

> thus to teach and the right of parents to engage him so to instruct their children, we think, are within the liberty of the {Fourteenth} Amendment (p. 7).

Later in 1971, the state of Wisconsin convicted parents of an Amish family for violating the state's compulsory attendance laws and refusing to send their children to school after the age of 14 and 15. In this case of *Wisconsin v. Yoder* (1972), the Wisconsin Circuit Court ruled in favor of the state of Wisconsin. However, the Wisconsin Supreme Court ruled that the ruling by the lower court and the compulsory attendance laws of the state of Wisconsin violated the First Amendment right of the family. The Wisconsin Supreme Court (1972) stated in its ruling that:

> The traditional way of life of the Amish is not merely a matter of personal preference, but one of deep religious conviction, shared by an organized group, and intimately related to daily living; the values and programs of the modern secondary school are in sharp conflict with the fundamental mode of life mandated by the Amish religion; secondary schooling, by exposing Amish children to worldly influences in terms of attitudes, goals, and values contrary to sincere religious beliefs, and by substantially interfering with the religious development of the Amish child and his integration into the way of life of the Amish faith community at the crucial adolescent state of development, contravenes the basic religious tenets and practice of the Amish faith, both as to the parent and the child; compulsory school attendance until the age of 16 for Amish children carries with it a very real threat of undermining the Amish community and religious practice as it currently exists; thus, enforcement of a state's requirement of compulsory form education after the eighth grade would gravely endanger, if not destroy, the free exercise of Amish religious beliefs (p. 4).

In another landmark case for home schooling in 1978, in *Perchemlides v. Frizzle* (1972), parents of a second grader refused to return their child to public school for the third grade in Amherst, Massachusetts. After following the state law in submitting a home education plan to the school superintendent for approval for home schooling, the school district denied the family's request to home school. The Perchemlides family appealed to the court to overturn the decision. In Brumstead, (1979) the court stated,

> It should not consider the parents' reasons for wanting to educate their child at home; the lack of a curriculum identical to that provided in the public schools; the lack of group experience (the socialization factor, so-called); the creation of a precedent, if any, if the plan is approved; and any other factors that deviate from the substance of the plan in relation to whether it is an adequate home education alternative (p. 99).

The court in this case, "upheld the right of non-religious as well as religious parents...to choose from the full range educational alternatives for their children" (Lachman, 1991, p. 10). Home school advocates look to this case as one that protects their First Amendment rights--the right to freedom of religion and freedom of expression from government interference.

Characteristics and Demographics of Home Schooling Studies

During the last decade, many researchers have conducted research to determine the characteristics and demographics of home school families and to examine the reasons parents choose this alternative method of education in the United States. The following summarizes recent research on the characteristics of home school families, reasons they choose home schooling, and to profile the demographic background of home school families.

Family Characteristics Related to Home Schooling

Ray (1990) produced one of the first nationwide studies on home school families. The study surveyed 1,516 home school families nationwide. The primary purpose of the study was to determine family demographic and educational characteristics of home school families. Ray found that the typical home school had the following demographic characteristics:

1. The average father and mother had over 14 years of education.

2. Mothers were the primary educators (88%) in the home school. Mothers of home schoolers also had significant education beyond high school with 67% of the mothers having either some college background to holding an advanced degree.

3. The average number of children per family was 3.21.

4. Home school families visited the library an average of 3.09 times per month.

5. The median income for home school families was between $35,000 and $49,999. This compared to the median 1987 family income of $30,850 nationwide.

6. Over 90% of the families reported that they were Christian with Independent Fundamental/Evangelical, Assembly of God, and Independent Charismatic as the top three religious choices for the fathers and Independent Fundamental/Evangelical, Baptist, and Independent Charismatic as the top three choices for the mothers respectively.

7. Nearly an equal number of males (50.9%) and females (49.1%) were home educated.

8. The average home schooling lasted three years.

9. Nearly 26% of the home school children had attended a public school prior to attending home school and 24.4% had attended a private school prior to home school.

10. Nearly 53% of the parents planned on home schooling their child up to high school.

11. Parents reported that they "hand picked" the major parts of the curriculum for 67% of their children.

12. Information collected on 99 students indicated that over 50% of the home school children attended a junior college or four-year college after being home schooled (p. 16).

Wartes (1990) study, similar to the Ray (1990) study, provided a descriptive study on home school families in Washington. Wartes found similar demographic characteristics with the home school families in the state of Washington survey. The families in the Wartes study also reported:

1. The average mean income of families was between $30,000 to $35,000.
2. Only 2% of the parents had less than a 12th grade education.
3. The average number of consecutive years home schooled was 2.7 years.
4. Nearly 99% of the families reported that they were affiliated with some Christian faith. The most popular religious choice was nondenominational (42.3%) and Conservative evangelical denomination (30.7%) (p. 5-6).

In 1990, Richman, Girten, & Snyder (1990) replicated the Wartes (1990) study in Pennsylvania to determine its generalizability of the Wartes study and to gather demographic characteristics on home schooling families in Pennsylvania. A total of 129 of the 171 parents returned the survey for the study. Richman et al. found similar results in their study. Below summarizes some of their demographic characteristic findings:

1. The educational mean average was 14.6 years for the primary parent.
2. Hours of formalized instruction spent with children per week were 16.2 hours.
3. Median annual income of families was $30,000 to $34,999.
4. Parents reported that 33% of the children had attended a private school prior to home school and 47% were always home schooled (p.11).

In 1997, Ray conducted a similar nationwide study to the 1990 study. In this study Ray surveyed family members from a large national home school organization. A total of 5,995 surveys were sent out to home education families in every state. Ray received approximately a 28.8% response rate or 1,657 families with information on 5,200 children. Using descriptive statistics and frequency counts Ray found similar results to the previous study. Ray found that 96 percent of the parents were white; mothers were the primary educators (88%) for their children; 32 percent of the of the parents earned a bachelor's degree; fifty-three percent of the families visited the library one to two times

per month; the family's median income was $43,000; the average number of children per family was 3.3; ninety-eight percent of the families were headed by married couples; and over 83 percent of the families identified with some religious faith.

Ray also reported that many of these children were active outside of their home school with 47 percent participating in group sports, 33 percent did volunteer work, 84 percent were involved in field trips, and 87 percent play with other children outside of their families. The findings of this study were similar to many of the earlier studies (Ray, 1990; Richman et al., 1990; Wartes, 1990). One of the continued concerns of studies conducted on home schooling is the small response rate making it very difficult to generalize. Many researchers point to home schooler's skepticism of researchers and the government as reasons for not responding or participating in these studies (Ray, 1997; Wartes, 1990).

In 1999, Rudner conducted the most comprehensive nationwide report on the demographic characteristics of home school students. Rudner surveyed 11,930 families from all 50 states. A sample of Rudner's survey results included:

1. A total of 49.6% of the sample was male compared to 51.4% nationally.
2. The majority of the population of students was White (94%) with 0.8% reported Black and 0.2% Hispanic.
3. A total of 97.2% of the parents reported that they were married.
4. More than 90% of the families reported that they had a religious preference.
5. Mothers who were the primary educator in the home school reported that 66.4% had obtained between an associate's degree to a doctorate degree. The fathers reported that more than 73.1% had earned between an associate's and doctorate degree.

6. On average, home school families in 1997 earned about $52,000 annually, which compares to $36,000 nationally. A reported 21.6% of the home school families earned $75,000 and over annually.

7. Home school families reported that 65.3% of the fourth-grade students watched 1 hour or less television daily compared to nationally of 25.1% who watch 1 hour or less.

8. The median amount of money spent on educational materials (textbooks, lesson materials, tutoring, etc.) for home school families was $400 (Rudner, 1999, p. 26-32).

College Admission and Home Schooling Issues

Barnebey (1986) provided the most extensive and landmark study on admissions requirements for home schooled students. The purpose of this study was to identify and compare the requirements for admissions of home schooled students at 210 four-year public and private colleges. Barnebey was also interested in finding out if the type of institution, size, support, and location had an affect on the admissions of home schooled applicants or the attitudes of admissions officers. Additionally, Barnebey examined the types of required documentation needed for home schooled applicants at these 210 institutions.

Using a descriptive method of research, Barnebey (1986) sent surveys to 210 selected four-year colleges and universities with an 83 percent response rate. Barnebey used the non-parametric Pearson Chi-Square Test to analyze the null-hypothesis of four-categories of information that included demographic information, conventional admissions requirements, admission of home schooled students, and attitudinal concerns.

Barnebey found that there was no significant difference based on grouping of institutions by Carnegie categories of Research, Doctorate, Comprehensive, and Liberal Arts institutions. There was a statistical difference based on support base of public and

private institutions that accepted home schooled applicants and those that had not. The study also revealed that there was not a statistical difference in size or location between the institutions and whether or not the institutions had accepted home schooled applicants or had not.

In examining the documents required for admissions, Barnebey found that there was also statistical significance between the requirements of submitting the Achievement Test (ACT) with the application for admissions. A statistical significance was also found between the requirement of other personal reference and essay documents for admissions and whether or not the institution had accepted home school applicants.

Finally, Barnebey examined the attitudes of admissions officers toward home schooled applicants. Barnebey found a statistical significance in the admissions officers' response as to whether they would recommend that home schoolers attend a junior or community college before applying to their universities. There was also a statistical significance in the expected success of home schooled applicants. Admissions officers from seventy-three percent of the institutions that did not accept home schooled applicants believed that the home-schooled applicants would be less successful than the students who attended other conventional schools.

Barnebey concluded that the "smaller, liberal arts colleges and universities" appeared less willing to accept home schooled applicants (p. 146). Barnebey also indicated that "restrictive legal parameters which emphasize objective criteria may make it more difficult for admissions officers in public universities and colleges to evaluate home schooled applicants" (p. 146).

In 1999, Villanueva investigated the admission standards at 75 four-year randomly selected colleges and universities in the United States. Fifty-one (68%) admission directors returned the six-item survey regarding their entrance requirements for home school graduates.

Villanueva found that all institutions considered home school applicants for admission to their schools and seventy-four percent of the institutions indicated that they had enrolled home school graduates to their institutions. Villanueva found that 68% of the institutions had enrolled 10 or fewer home school graduates at their institutions. One institution reported that they had an enrollment of more than 250 home-schooled graduates.

Villanueva also found that ninety percent of the institutions based admission on ACT or SAT scores and 94% required an acceptable transcript. Fifty-five percent of the colleges and universities also accepted the GED for admission with 35% actually requiring the GED for entrance.

Finally, Villanueva found that 65% of the institutions reported that home school graduates could qualify for merit-based scholarships. However, 14% indicated that home school graduates could not qualify for merit scholarships at their institutions.

Davis (2000) examined admission policies and procedures at 15 four-year public institutions in Virginia to understand how home school admission is evaluated. In this multiple case study, Davis was interested in examining current admission policies and procedures, whether policies and procedures are written, how admissions officers considered the potential impact on the Virginia Standards of Learning (SOL) assessment program on admission decisions, how and who reviews home school admission

applications, who makes the final decision on home school candidates, what factors are considered in admission decisions of home school applicants, and how many home school applicants were received during the past three years, 1997-1999 (p. 3).

Davis (2000) interviewed each admission officer or his or her designee at all 15 four-year institutions. In addition, information was collected from written materials, web sites, and other promotional materials to examine institutional admission home school admission policies and procedures. To ensure trustworthiness, each institution continuously verified the accuracy of the data collected (p. 25).

In this study, Davis (2000) found that found that none of the 15 institutions had tracked home school enrollments, however all institutions reported an increase in the number of both inquiries and applications from home school applicants. Only one of the 15 institutions reported receiving more than 15 applications from home school applicants.

Davis (2000) also found that only two institutions reported having a written home school admission policy. At four of the 15 institutions, no new home school admission policies were anticipated in the future. Another four institutions stated that they believed their current admission policy was appropriate for the evaluation of home school applicants (p. 127). While four other institutions reported that they would create a home school admission policy if the application numbers increased for home school applicants.

Davis (2000) found that the admissions staff at 14 institutions evaluated admission applicants. Only one institution utilized an outside reader in addition to the admissions staff. All 15 institutions reported that home school applicants were reviewed similar to regular applicants (p. 133). Davis indicated that 13 institutions identified standardized test scores as "more relevant for home school students" (p. 134).

In 2001, O'Neill conducted a descriptive study to evaluate the home school resources available for university admissions personnel. In the review of the literature, O'Neill examined the history, trends, and policies that were available to assist admissions personnel for establishing admission policies. O'Neill found that very little literature was available to assist admissions officers in "understanding the diversity of home school populations and in developing policies and practices allowing for such diversity while maintaining institutional integrity, consistency, fairness, and mission has not been developed" (O'Neill, 2001, p.33). This study fell short of examining current academic performance studies on home schoolers in college but was useful for examining the challenges admissions officers have in developing admission policies.

Academic Achievement Issues in Home Schooling

In recent years, public schools across America have been faced with new policies and public outcry for a need for more accountability. At the heart of much of this public scrutiny is a need to improve the control and welfare and the academic performance through on-going assessment of school-aged children across the country (Meeks, Meeks, & Warren, 2000). Over the last 20 years, the same public scrutiny has plagued the home school community (Marlow, 1994). The Home School Legal Defense Association, which is a active legal home school association, indicated that nearly all 50 states require on-going standardized assessments of home school children (Home School Legal Defense Association, 2001). These assessments suggest that state policy makers and school officials are attempting to hold home school program's parent-teacher accountable for their children's education.

The following sections summarize recent research on the academic achievement and outcomes of home school children at the elementary and secondary level and at the post-secondary levels.

Elementary and Secondary Level Studies

Many of the studies on the performance and academic achievement of the home-educated student to date have been conducted at the elementary and secondary levels in education. However, much of what has been studied falls into the descriptive research category.

In 1987, Rakestraw conducted one of the first quantitative studies comparing the academic achievement between home schooled elementary children and public elementary schooled children in Alabama using the Stanford Achievement Test. Additionally, Rakestraw surveyed the families of the home school children to determine the demographic characteristic profile of home school families.

In the study, 100 families agreed to participate in this study. The selection criteria for each family was that they must have been home schooling at least one child between the age of 6-12, reside in Alabama, and be willing to transport their children to a testing site. A total of 60 parents were selected for the study and 84 children met the criteria to participate.

Five levels of the Stanford Achievement Test 7th Edition were administered to each child in grade levels first, second, third, fourth, fifth, and sixth. For comparisons, the Rakestraw used the Alabama public school spring 1986 Stanford Achievement Test results obtained from the Alabama Department of Education.

Rakestraw (1987) used t-tests and univariate analysis of variance statistics to test eight null hypotheses. The following summary of achievement findings were reported:

1. For grade level one, of the 10 subtests on the Stanford Achievement Test results, the home school students scored above the national norm on six subtests, at the national norm on two subtests, and below the national norms on two of the achievement tests.

2. For grade level two and three, all home school second graders scored above the national norm on all subtests.

3. For the grade level four, the home school children scored above the national norm on nine subtests, at the national norm level on two subtests, and below the national norm on one subtest.

4. For grade level five, home school students scored above the national norm on five of the twelve subtests, at the national norm for five subtests, and below the national norm on two subtests.

5. In grade level six, the home school children scored above the national norm on 11 out of 12 subtests and at the national norm on one subtest.

6. For grade levels one, two, and five, no significant differences were found between home school students and public school students in the Total Reading and Total Listening domains. However, the results from grade two revealed that the home school students outperformed public school students in the same categories.

7. When the groups were grouped according to gender and an Analysis of Variance was tested, grades three, four, five, six, the group of males were determined too small for a statistical comparisons. For grade levels one and two, there was no statistical significance.

8. To determine if there was a significant achievement difference of home school students when grouped by the educational background of the home school parent-teacher's educational background (high school education, one-three years of college, or four years of college or more), Rakestraw found no statistical difference in achievement in any of the subtests. There was also no significance found when evaluating the achievement of home school students and whether the parent-teacher had a teaching certification or not.

These results on the Stanford Achievement Test appear to suggest that in the late 1980s, home school children were performing overall as well as their peers on national

standardized achievement tests. Furthermore, it may point out that there might not be a need for further skepticism that educators and community members might have regarding the parent's ability to serve as the primary teacher for their children. These results suggest that the level of the parent's educational background had no negative affect on the academic achievement of their home-schooled children (Rakestraw, 1987). However, some caution may be necessary due to the sample size of the home school population and families who volunteered to participate in the study.

Frost (1987) also conducted a study on the academic achievement of elementary school-aged home school children that were home educated for two or more years. This descriptive research study examined the academic achievement performance of 74 home school children in five northern Illinois counties on the Iowa Tests of Basic Skills (ITBS). The dependent variable was the results of the home school children scores received on ITBS examination in grades three-six. The results were then compared to Iowa's national norms for Catholic school children. National norms for the non-Catholic private schools were not available to the researcher.

Frost's findings revealed that the home school students in these five northern Illinois counties scored above the national norm in all grade levels in Vocabulary, Reading Comprehension, Language Skills, Work-Study Skills, and Mathematics Skills. Additionally, it was also found that the students, when grouped by high socio-economic status and whether they would have attended a private school, scored as well as their peers in the private and Catholic school educational settings (Frost, Jr., 1987). The only thing that can be determined from these reported results is how the home school students scored on the ITBS test. Comparing these results in the manner that they were conducted

gives some concern in its ability to generalize or compare. Specifically, with Frost's idea of requesting home school parents to respond to the question of where they would have attended school had they not home school and then comparing them to that population.

In 1990, Wartes provided a significant contribution to the research on home school academic outcomes in the State of Washington. In this study of more than 2,911 Washington home schooler's test scores on the Stanford Achievement Test series between 1986-1989, those home schoolers performed between the 65th to 68th percentile each year, indicating that home schoolers "are not as disadvantaged compared to their conventional school counterparts" (Wartes, 1990, p. 2) as might be assumed by the general public. In examining all grade levels assessed on the Stanford Achievement Test, only grade level three consistently showed some reasons to be concerned with their test results, which was not mentioned by Wartes. Between 1986-89, only grade level three scored below the 60th percentile in total reading, language, and mathematics each year.

The results of Wartes' study are significant because this was on the first study that actually assessed all home school students who were tested on a national standardized test. Many of the studies reported in this literature are self-reported test results that are obtained from a survey.

In another study in 1990, Richman et al., (1990) later replicated Wartes' (1990) *Washington Homeschool Research Project* study in the state of Pennsylvania. The purpose of their study was to replicate the Wartes study and "to determine whether it is appropriate to generalize its conclusions about factors affecting home school achievement" to the home school population (Richman et al. p. 9). In their replicated

study, Richman et al. used the Comprehensive Test of Basic Skills 4th Edition Survey Test instead of the Stanford Achievement Test that was used in the Wartes studies.

In Pennsylvania the home education law requires that home-educated children be tested in mathematics and reading in grades three, five, and eight. Therefore, only the "Total Reading" and "Total Mathematics" scores were used for their analysis. In the Pennsylvania study, 174 students were tested. However, due to improper assessment of three students at the wrong grade level, these tests were eliminated. Therefore, only 171 students were included in the final analysis.

Richman et al. (1990) found that overall scores were higher than the Washington study. The mean scores were in the 86th national percentile in total reading and in the 73rd percentile in mathematics. However, the mean test scores were found to be much higher than the mean test scores of the Washington study. Richman et al. also found no correlation between the formal education of parents and academic achievement.

Based on the results, Richman et al. suggested that, "the Washington survey data can be generalized to home education families in other states and the Washington linear regression data can be generalized to measurement of reading and mathematics achievement with other standardized achievement tests" (Richman et al. p. 15).

Many researchers point to Ray's (1990) study, which was a nationwide study highlighting the demographic characteristics of academic achievements of home-educated students. Ray's (1990) national study surveyed 1,519 home schooling families throughout the United States. Of those families who returned the surveys, 66% or 973 test results were attached with the survey (Ray, 1990). The California Achievement Test,

Iowa Test of Basic Skills or the Stanford Achievement Test was the most common test used by home schooling families.

The results of the Ray study found that home schooling families on the average scored at or above the 80th percentile on these nationally standardized tests, which compared to conventional schooled students scoring at the 50th percentile on these same tests.

Brown (1992) also surveyed 74 home school families to determine the academic performance of their children and to provide a demographic profile of the population. To determine the academic achievement of the home school population, Brown analyzed the Stanford Achievement Test results of the families. Unfortunately, only 34 or 45 percent of the Stanford Achievement Test results were received from the families. This low response rate represents a concern in the study. It may very well be that parents who chose not to submit their children's test results did so due to low scores.

Brown's (1992) results on the 20 subtests of the Stanford Achievement Tests revealed that the home school students performed five grade equivalent levels above public school students in their grade levels. While home school students outperformed public school on all subtests, the smallest mean difference was obtained on the Mathematics Computation subtest, which was a mean difference of 2.09 grade equivalent levels above. Brown's results also revealed that there was a significant relationship between academic achievement of home schooled students and their parent's education, the major reasons for home schooling, years of home schooling, socioeconomic status level, student age, number of siblings at home, gender of student, and their race. This was true for 10 of the subtest categories in Word Study Skills, Total Math, Concepts of

Numbers, Computation, Total Language, Language Mechanics, Science, Using Information, Basic Battery, and Complete Battery.

Medlin (1994) analyzed the scholastic aptitude and educational self-concept of 36 home schooled children grades three through six and their parent's teaching practices to determine which variables best predicted the academic achievement of home school children. Medlin "hypothesized that aptitude and self-concept would significantly predict achievement, and that the achievement scores would be significantly higher than aptitude scores" (Medlin, 1994, p. 2). The home school students in this study were assessed on three tests. Students were tested on the Stanford Achievement Test, the Otis-Lennon School Ability Test (OLSAT), and the Piers-Harris Children's Self-Concept Scale (PHCSCS). According to Medlin, the OLSAT is a norm-referenced test that measures abstract thinking and reasoning ability with verbal, pictorial, and quantitative stimuli. The PHCSCS is a 17-item test that measures academic self-concept.

Medlin's (1994) finding revealed that the mean scores on the Stanford Achievement Test were at the 66 percentile ranks and the mean scores of the OLSAT were at the 58 percentile ranks. While this was yet another small sample, these scores are consistent with many of the previous studies (Brown, 1992; Rakestraw, 1987; Ray, 1990; Richman et al., 1990; Wartes, 1990) that report that home school students score at or above the national average. The mean scores on the PHCSCS were at the 72 percentile ranks. This study used the Wilcoxon matched-pairs signed-ranks test to determine a difference between the achievement and aptitude. The test revealed that the achievement scores were significantly higher than aptitude scores at the z of -2.33, $p = .020$. When correlations were analyzed among achievement, aptitude, and self-concept for all grades,

aptitude scores were determined to be significantly correlated with achievement scores. However, self-concept scores were found only significantly correlated with achievement scores at the sixth grade level. Unlike some other studies, Medlin found that there was a significant correlation between the parent's education and academic achievement and aptitude scores.

In 1999, Rudner conducted the most comprehensive nationwide report on the scholastic achievement and demographic characteristics of home school students. To examine the academic achievement of home school students, Rudner solicited the help of Bob Jones University Press Testing and Education Services to administer the Iowa Tests of Basic Skills. In the spring of 1998, 39,607 home school families were requested to complete a questionnaire on home school demographics. A total of 20,760 home school children in grades K-12 using the Iowa Basic Skills Test (ITBS) for grades K-8 and the Tests of Achievement and Proficiency (TAP) for grades 9-12 voluntarily participated.

In this study, Rudner was interested in finding out if home schooling works for those families who chose home schooling and how home school students compared to public school students on standardized achievement test: specifically on the ITBS and TAP examinations (Rudner, 1999). Rudner's study revealed that home school students fared well on both the ITBS and the TAP examinations. Rudner's major findings include the following:

- Almost 25% of home school students are enrolled one level higher than their peers in public and private schools.
- Home school student achievement test scores are exceptionally high. The median scores for every subtest at every grade (typically in the 70^{th} to 80^{th} percentile) are well above those of public and Catholic/Private school students.

- On average, home school students in grades one-four perform one grade level above their age-level public/private school peers on achievement tests.

- The achievement test score gap between home school students and public/private school students starts to widen in grade five.

- Students who have been home schooled their entire academic life have higher scholastic achievement test scores than students who have also attended other educational programs.
- There are no meaningful differences in achievement by gender, whether the student is enrolled in a full-service curriculum, or whether a parent holds a state issued teaching certificate.

- There are significant achievement differences among home school students when classified by amount of money spent on education, family income, parent education, and television viewing (p. 26).

While Rudner's study compared home school students to the 1995 national norms of public school and non-public school students and samples were stratified geographically, by district enrollments, socioeconomic status of each district or by school type, in this discussion, researchers were cautioned from comparing these results between these groups. Limitations that Rudner mentioned in this study included that the "families are not a cross-section of the United States population" and that the home school population was not a "controlled experiment" (p. 27).

In a response to Rudner's 1999 study, Welner, K.M. & Welner, K.G. (1999) argue that while this study expands the sample size of previous similar studies, Rudner (1999) fails to adequately point out the limitations in this study. In their response, criticism was made of the non-random small home school sample used and concern that the sample was "biased in favor of a population associated with Bob Jones University, extrapolations from that data are very unreliable. Furthermore, Welner & Welner (1999) argued that the

results of the study should not be "compared to homeschoolers' achievement levels with those of the general population" (Welner & Welner, 1999, p. 2).

Post-secondary Educational Level Studies

Few studies have been conducted on the academic performance of home school graduates at the post-secondary level. One reason for the limited number of studies could be the lack of data available to researchers. For example, Colorado has only been coding home school graduates within the past couple of years.

One of the first studies to examine the performance of home school students in college was Mexcur in 1993. Mexcur (1993) compared the academic achievement of 145 public school graduates, 454 conventional Christian school graduates, 23 Accelerated Christian Education (ACE) graduates, and 10 home school graduates enrolled at three private Christian universities in Florida, Michigan, and South Carolina during the 1991-92 academic year.

In this study, Mexcur collected data from the academic records, which included each student's ACT subtests and composite scores, first and second semester English grades, and the overall grade point averages for each semester of the freshman year. ACT scores and grades were then compared to determine if there was any statistical significance between each of the four groups.

Mexcur's results revealed that there was only significance between the ACT mathematics scores of public school graduates and conventional Christian school graduates and between public school graduates and the ACE school graduates. In both cases, the public school graduates outperformed each group. Mexcur also found significance between the first semester English grades of home school graduates and

public school graduates and between public school graduates and conventional Christian school graduates. The home school graduates had the highest English grade point average of the four groups.

In this study, while the results are consistent with other later studies, an obvious weakness is the home school sample size of only 10 students. However, researchers must be cautious with generalizing this study based on the small sample size and the fact that this sample only included private Christian universities in the study (Mexcur, 1993).

Oliveira (1994) conducted a study on the differences in selected critical thinking skills among 789 first-time college freshmen who were high school graduates from Christian schools, public schools, Accelerated Christian Education (ACE) programs, and home schools. Oliveira used the California Critical Thinking Skills Test (CCTST) to determine whether there were significant differences in critical thinking skills and ACT composite test scores of students who graduated from four different educational settings. The CCTST test is a 45 minute standardized test that measures critical thinking skills of post-secondary students. The tests, which is a 34-item multiple choice exam, provides six scores including an overall critical thinking cognitive score, five sub-scales in viz., analysis, evaluation, inference, and deductive and inductive reasoning. The CCTST test was administered during the freshman orientation classes in two sections.

Oliveira (1994) found that there were no significant differences between the CCTST mean scores of the four groups on the overall scores or the sub-scales scores on analysis, evaluation, inference, deductive reasoning or inductive reasoning. Oliveira did find that there were significant differences in the English ACT scores between Christian, home school graduates and public school graduates. Both Christian school graduates and

home school graduates scored higher on the English ACT score than public school graduates. A significant difference was also found between public school and ACE school graduates on the ACT mathematics subtest. Public school graduates scored higher than the ACE school graduates did.

While the Oliveira study included home school graduates, the small sample of 58 participants may be too small to generalize to the home school population. Oliveira also recognized this limitation commenting that "the number of subjects in each group lacked balance" (Oliveira, 1994, p. 96).

Of the few quantitative studies on academic performance of home schooled students in college, Galloway (1995) presented the most extensive comparisons of home schooled students and students who have attended traditional schools. Galloway's study included 180 first-time students enrolled at a large, private Christian university in the southeast. Each group consisted of 60 students each with all enrolled home-schooled students, and the 60 each who were randomly selected from public schools and 60 conventional private schools. The purpose of the study was to investigate the academic aptitude for and achievement in English of enrolled home-schooled students compared to students from public school and private educational settings.

Data were collected for all subjects and included grades from a required English Composition and Rhetoric course, grades earned on the major writing assignment, quizzes, tests, and the final exam for the course. Scores from the ACT (English, mathematics, reading, and science reasoning) and the ACT composite scores were also used to determine aptitude for college level English.

Galloway (1995) found that statistical significance only existed between the home-schooled graduate's English subtest scores and the conventional private school graduate on the issue of student's aptitude for college English. The mean scores for the home school gradates were 24.73 compared to 22.43 for the conventional private school graduates. The findings for whether home-schooled students demonstrated "similar academic preparedness for college," than their peers indicated that home schooled students were as prepared as the students from public and private schools (p. 15). While the results were not statistically significant on the question of academic preparedness for college, it was reported that the home-schooled student's mean scores were higher than both groups. Galloway's findings are consistent with later studies on the college performance of home schooled students when compared to students who have attended traditional schools (Gray, 1998; Jenkins, 1998).

Jenkins (1998) conducted a study to analyze the performance of home-schooled students compared to non-home-educated students in community colleges. In this study, data was gathered from the states of Oregon, Michigan and Texas. Unfortunately, due to a small sample, the study on academic performance was limited to community colleges in Texas. Jenkins also surveyed community college admissions officers to determine their attitudes toward home-schooled applicants and to examine the college's admissions requirements for home schooled applicants.

Jenkin's (1998) study included 101 full-time and part-time, first-time enrolled home-schooled students from twenty-one community colleges in Texas and 36 non-home school students enrolled between 1994 and 1996. Data was collected for the home-schooled students from their academic transcripts. The dependent variable was grade

point averages (GPA) and scores from the Texas Academic Skills Program (TSAP). The TSAP is a mandated assessment for all first-time students and includes assessment in the areas of reading, mathematics, and writing. Jenkins reported that the TSAP scores could be exempted for students with high-test scores on the SAT or ACT assessment.

Jenkins (1998) found that the 49 full-time home schooled students averaged a 3.06 GPA compared to a 2.56 GPA for the 18 non-home schooled students in their first-year in college, which was statistically significant. Jenkins also found that the 52 part-time home school students had a statistically significant GPA 3.27 compared to 2.40 for 18 non-home schooled students. Jenkins compared the 57 home school student's available scores with the non-home school students. Jenkins found that the home-schooled students again out performed their peers in reading and mathematics on the TSAP. There was no statistical significance on the writing portion of the TSAP between the three groups.

In terms of the attitudes of the admissions officers surveyed, Jenkins reported that 36% of the admissions officers expected the home schooled students to be equally successful as traditional K-12 students, 23% did not have an opinion on the success and 10% left the survey blank. It was also reported that 52% of the admissions officers surveyed believed that home schooled students were prepared for college, 20% of the admissions officers thought that home schooled students were not prepared for college, and 27% did not state whether they believe home schooled students under the age of 18 were academically prepared for college. In Oregon, none of the admissions officers thought that home school students would be more successful than the non-home school

students. Jenkins' study found that the attitudes toward the preparedness of home schooled students for college was not consistent for 47% of the respondents.

Finally, Jenkins (1998) found that 80% of the community colleges in Michigan and 86% in Oregon had an admission policy for home-schooled students, while Texas reported that just over half of the community colleges had such a policy. However, over 87% of the community colleges in Texas reported that they had admitted students who were home educated. The study also reported that 52 out of 72 of the community colleges stated they felt that the General Educational Development (GED) was an "adequate replacement for the high school transcript" (p. 111).

While Jenkins' study reported statistically significant differences between home schooled and non-home schooled students, there is concern to the generalizability of the traditionally schooled group due to the very small sample of 36 students. This sample size may not be very represented of the traditional K-12 schooled population.

Gray (1998) also conducted a study to examine the academic achievement of home-schooled graduates who attended institutions in the state of Georgia compared to graduates of traditional K-12 schools. The study included 56 freshman home schooled graduates and 44 traditional schooled students. A total of 38 home-schooled parents also participated in the study in order to examine the "views of home-schooled students and their parents concerning the development of socialization skills" (p. 8).

In this quasi-experimental study, admissions officers at the three institutions identified the home-schooled students for the study. Data was gathered using surveys that were circulated at regularly scheduled meeting between the home schoolers and admissions officers and through follow-up phone calls and mail-in surveys. The

traditional students were randomly selected from a mailing list that was also provided by the admissions officers of the institutions.

Academic performance was measured by comparing the self-reported SAT standardized test scores, English grades, and the cumulative grade point averages of each group. Students represented three institutions in Georgia including a public university, a private university, and a private college. Gray (1998) found that there were no significant differences between the three groups on the SAT scores, English grades, or cumulative grade point averages. This indicates that the home schooled students were as prepared and had achieved at a similar level as their peers from public or private conventional schools.

Gray (1995) reported that both home schooled students and their parents believed 100% that their education had prepared them to be successful in college. On the question of whether there was a difference between how home schooled students and parents perceived socializations skills of the home schooled student, 73% of the home schooled students responded that they believed their socialization skills were not lacking. Eighty percent of the parents believed their children were properly socialized.

In a more recent study on the performance of home-schooled students, Donahue (2001) examined one of the first longitudinal studies on home-schooled students. The purpose of this five-year study was to examine the performance of 113 home-schooled students attending Indiana University Purdue University Indianapolis (Donahue, 2001). Donahue examined home-schooled students in four groups. The first group was home-schooled students who were dual enrolled. Dual enrolled students were students who were enrolled in college but have not yet graduated from high school. The second group

that was examined were students who were enrolled in national correspondence courses and college. The third group examined were home school students enrolled in degree seeking programs at the university. Finally, Donahue examined the performance of all home-schooled students enrolled.

Donahue found that the 40 home schooled students who were dual enrolled between fall 1996 and fall 2000 had an average GPA of 3.43 in their first semester of college. In the fall of 1999 the nine students enrolled had an average GPA of 3.89 while 13 students who were enrolled in the fall 2000 semester earned an average GPA of 3.63. The 25 students who were enrolled from the national correspondence courses earned an average GPA of 2.39 in their first semester. Donahue (2001) found that the 88 first-time degree seeking home school students earned a 3.13 average GPA between the same time-period. The largest class enrolled was 25, which was during the fall 2000 semester. This class of first-time freshman earned a 3.04 GPA in their first semester of college.

Finally, when the combined performance was examined of all home-schooled students who had enrolled; it was found that all home-schooled students earned an average GPA of 2.97 in their first semester. Donahue's study suggests that whether home school students enroll as dual enrolled students or as degree seeking students, that they are successful in college.

Summary

With the continued growth in the home school movement, it does not appear that this movement will decline anytime soon. While there continues to be a great deal of interest in the home school movement by researchers, there seems to continue to be a tremendous gap in the quality of empirical studies.

In 1999, Ray discussed the limitations in the research on home schooling, Ray stating that, "researchers find it challenging to obtain samples that are representative of all home schoolers in the populations of interest" (p. 18). The second problem that Ray identified in the research was the research on student outcomes for home school students were not experimental. Ray stated,

> That is, no one randomly assigns children to three types of education (i.e., public, private, and home), lets them live for ten years in those environments, then measures and compares their academic achievement, social and emotional maturity, and motor skills, all in order to determine whether the type of education caused differences in the measured factors. The reality is that researchers have to deal with intact groups and research that entail complex and confusing factors (p. 18).

One of the biggest gaps found in the literature is the lack of student outcomes studies of home school graduates at the post-secondary level. Jenkins (1998) stated it best in her summary of home school research stating that, "home school research is in its infancy and many areas are left to be explored" (p. 76).

CHAPTER III

METHODOLOGY

The purpose of this study was to determine if there were differences in first-year academic performance between home-schooled and traditional high school graduates in college measured by grade point average, retention, ACT test scores, and credits earned in their first year of college. Additionally, the study examined the attitudes and perceptions of admission personnel toward the home-schooled graduate.

Null Hypotheses

Phase I

To accomplish the stated purpose of the study, nine null hypotheses were tested to determine differences between home-schooled graduates and traditional high school graduates.

Hypothesis one. There is no significant difference in first-year grade point averages between home-schooled and traditional high school graduates.

Hypothesis two. There is no significant difference between home-schooled graduates and traditional high school graduates on whether they are retained in college during their first-year (fall to spring semester).

Hypothesis three. There is no significant difference in first-year credit hours earned between home-schooled and traditional high school graduates.

Hypothesis four. There is no significant difference in the ACT Composite scores between home-schooled and traditional high school graduates.

Hypothesis five. There is no significant difference in the ACT English test scores between home-schooled and traditional high school graduates.

Hypothesis six. There is no significant difference in the ACT Mathematics test scores between home-schooled and traditional high school graduates.

Hypothesis seven. There is no significant difference in the ACT Reading test scores between home-schooled and traditional high school graduates.

Hypothesis eight. There is no significant difference in the ACT Science Reasoning test scores between home-schooled and traditional high school graduates.

Hypothesis nine. There is no correlation between the following variables: first-year grade point average, first-year earned credit hours, first-year retention, and the ACT Composite test score.

In addition to data collected to test the above null hypotheses, data were also collected to determine if the groups were equivalent on the following variables: gender, race/ethnicity (minority versus non-minority students), and institutional type (college versus university enrolled).

Research Questions

Phase II

Phase II of this study was designed to examine the attitudes and perceptions of admission personnel toward the home-schooled graduate. To gain an understanding of the attitudes and perceptions of admission personnel, the following research questions were explored:

Research Question 1: What are the college admissions policies for home school applicants?

Research Question 2: What are the attitudes and perceptions of admissions personnel toward the home-schooled graduate population?

Participants

Phase I

Data for the nine hypotheses tested were requested and obtained from the Colorado Commission on Higher Education (CCHE) Undergraduate Applicant File and the Enrollment Cohort Tracking System. Home school graduates were identified by a high school code, transcript type, or by an identification number supplied by the institutions to CCHE. Colorado has only required four-year institutions to track home schooled graduates during the past three academic years. Therefore, due to an anticipated small sample and coding concerns, data for home schooled graduates were requested for those three years for all summer and fall terms available for first-time degree seeking freshman students enrolled at all Colorado four-year public colleges and universities. Once the home school sample was identified, a random sample was requested of traditional high school graduates who met the same criteria of the home school sample. Traditional high school graduates were first-time degree seeking students who were chosen from similar institutions as the home school sample. For example, if 10 home-schooled students were selected from Mesa State College than 10 traditional high school graduates were randomly selected from the Mesa State College first-time degree seeking student population during the same three-year period (1998-2000).

Sample 1. This sample consisted of four-year college/university first-time freshman degree seeking students who completed their high school in a home school high school setting. A home school high school code or transcript type indicator from the

CCHE Undergraduate Applicant File and the Enrollment Cohort Tracking System identified the sample. Home school graduates are coded by the institutions and supplied to CCHE via the Undergraduate Applicant File.

Sample 2. After the home school sample was extracted, a random sample was requested of first-time degree seeking freshman who were enrolled in similar Colorado colleges and universities as sample one and completed their high school in a traditional K-12 high school setting (public, private, parochial, etc.).

Phase II

The sample of the survey portion of this study were admission personnel from the Hawaii Association for College Admission Counseling (HACAC), the Pacific Northwest Association for College Admission Counseling (PNACAC), Rocky Mountain Association for College Admission Counseling (RMACAC), and the Western Association for College Admission Counseling (WACAC). These regional associations, which were a convenience sample, are members of the National Association for College Admission Counseling. Because this study focuses on the attitudes of admissions officers in the United States, only NACAC admissions personnel from the U.S. states were surveyed (The 2001 directory of leadership, 2001).

Only admissions officers who were members of four-year institutions from the HACAC, PNACAC, RMACAC, and WACAC were surveyed. All accredited four-year institutional members were sent an electronic survey.

Data Collection and Instruments

Phase I

Demographic data were collected from the Colorado Commission on Higher Education Undergraduate Applicant File and the Enrollment Cohort Tracking System. The following dependent variables were used:

1. Overall freshman cumulative grade point average,
2. Cumulative credit hours earned,
3. SAT Combined test score (converted to ACT Composite score and only used for those students who did not have a ACT Composite score),
4. Gender,
5. Race/Ethnicity,
6. ACT Composite test scores,
7. ACT English subtest scores,
8. ACT Mathematics subtest scores,
9. ACT Reading subtest Scores, and
10. ACT Science Reasoning subtest scores.

With nearly half of college freshman expected to leave college without ever graduating with an associate or baccalaureate degree, many college officials are not only concerned with recruitment of students but how to successfully retain them beyond the first-year of college (Gerald, 1992; Ting, 1998). Data collected for the first phase of this study were the ACT Composite test scores and the four subtest scores (English, Mathematics, Reading, Science Reasoning). Additionally, data were collected to determine the first-year academic performance measured by the first-year grade point average, retention, and credit earned during the first year.

Reliability and Validity

Many studies have been conducted on the reliability and validity of ACT test scores and its ability to predict college success measured by first-year grade point average. Several studies have shown that the ACT Composite test score is a reliable predictor of first-year success in college (ACT Assessment: Technical Manual, 1997; Galloway, 1995; House & Keeley, 1997; Kern, Fagley, & Miller, 1998; Rodriguez, 1996; Schade, 1977; Snyder & Elmore, 1983). According to ACT (2001), the ACT Assessment philosophy of the assessment is stated as:

> The tests of educational development are oriented toward the general content areas of college and high school instructional programs. The test questions require students to integrate the knowledge and skills they possess in major curriculum areas with the information provided by the test (ACT Assessment: Technical Manual, 1997, p. 2).

House & Keeley (1997) also found in their study that the ACT Composite Test score was a valid assessment for American Indian students as a predictor of college success; while, Rodriquez (1996) found similar results in a study conducted on Mexican American students.

In a 1995 study conducted by ACT on the reliability of the ACT Assessment scores, reliability coefficients were at .85 to .92 on each subtest and a coefficient of .96 on the ACT Composite test score. To ensure content validity, ACT provides ongoing assessment of the content validity by ensuring that the "test content is representative of current high school and university curricula" (p. 37).

Ethical Consideration

Federal regulations mandate that all research be reviewed by a human subjects review panel to protect human subjects and to deal with "ethical issues related to the

project" (Gliner & Morgan, 2000, p. 353). Colorado Commission on Higher Education (CCHE) also requires all researchers who are requesting enrollment data to comply with the CCHE Information Policy (Policy Concerning the Privacy of Student Records) prior to approval of data collection. The researcher in this study was given approval from CCHE to conduct this study on December 1, 2000 (see Appendix A).

Phase II

Jenkins' (1998) survey instrument served as a model for the present survey. Permission was requested and granted from the author to modify the Jenkins survey (see Appendix B). A three-part questionnaire was developed to gather data on the home school admissions policies of four-year colleges and universities in Alaska, Arizona, California, Colorado, Hawaii, Idaho, Montana, New Mexico, Nevada, Oregon, Utah, and Wyoming. The institutions were selected because they represent the entire western and rocky mountain regions of the United States.

Section One, Institutional Characteristics, includes institutional characteristics including institution type (state supported, private, or church affiliated) size, campus setting, and the Carnegie classification type. Section Two, Home School Admission Policies, requests information on the institution's admissions policies for home school graduates. Section Three, Attitudes and Perceptions, requests information from admissions officers on their perceptions and attitudes toward home school graduates (see Appendix C).

In order to establish face validity and to improve the questions and format of the survey instrument, a pilot study was conducted at the Rocky Mountain Association of Collegiate Registrars and Admissions Officers 21st Annual Meeting, July 18 - 20, 2001,

in Grand Junction, Colorado. Six admissions officers, two each from the states of Colorado, New Mexico, and Wyoming, who have knowledge of their home school admissions policy, were selected to participate in the pilot study. The participants reviewed and completed the questionnaire and provided feedback on the survey instrument.

After the feedback from the pilot test was reviewed, the final questionnaire and cover letter (see Appendix D) were mailed electronically October 2001, to admissions officers requesting their support in completing the survey. Names, addresses, and electronic addresses were obtained from the National Association for College Admission Counseling 2001 Directory. The National Association for College Admission Counseling is a non-profit national organization for college admissions and enrollment professionals worldwide. To ensure an adequate sample size, an electronic reminder letter was sent weekly (a total of three weeks) until the deadline for submission of October 19, 2001.

Ethical Considerations

Federal regulations mandate that all research be reviewed by a human subjects review panel to protect human subjects and to deal with "ethical issues related to the project" (Gliner et al., 2000, p. 353). An application for approval to conduct this study was granted through the Colorado State University Human Research Committee (see Appendix E).

Data Analyses

Phase I

The primary purpose of this study is to compare the first-year academic performance of home school graduates and traditional high school graduates measured on

the following four dependent variables: (1) grade point average; (2) retention; (3) ACT Test scores; and (4) credits earned in their first year of college. To test hypothesis one and hypotheses three through eight, the independent *t* tests was used. This is an appropriate test to use to test the mean differences between two mean scores (Walsh, 1990). A .05 level of significance (two tailed) was chosen as appropriate for this study. To test hypothesis two, a 2x2 chi square was used. To test hypothesis nine, Pearson product-moment correlations were used. This is considered an appropriate test to test "the association or relationship between two continuous variables" (Gliner et al., 2000, p. 252).

The final section of Phase I of this study, was designed to determine if there were statistical differences between home-schooled graduates and traditional high school graduates on the following three variables: (1) gender, (2) race/ethnicity (minority versus non-minority students), and (3) institutional type (college versus university enrolled). To determine if there were differences between the groups, the 2X2 chi-square was used. This is an appropriate nonparametric test to use when both the independent (with two levels) and dependent variables are categorical or nominal data (Gliner et al., 2000). A .05 level of significance (two tailed) was chosen as appropriate for this study.

Phase II

The secondary purpose of this study is to examine the attitudes and perceptions of admission personnel toward the home-schooled graduates. Data were collected from a survey containing 15 items. The survey instrument used rating scales, categorical scales, and rank-ordered scales. The data collected were analyzed using descriptive statistics and compiled in SPSS for analysis. To answer research question one, survey questions five

through seven and question nine (see Appendix C) were analyzed to understand the home school admissions policies of four-year colleges. To answer research question two, data were summated using questions 10-14 to understand the perceptions and attitudes of admissions officers toward the home-schooled graduates expected success in college.

Additionally, a supplemental analysis was conducted to examine if there were differences between rural, suburban, and urban institutions in how they expected the overall first-year success rate, and social coping of home-schooled students to be compared to traditional high school students. To test for differences, a One-way ANOVA was used. Secondly, to determine if there were differences between public and private institutions in how they expected the overall first-year success rate, and social coping of home-schooled students to be compared to traditional high school students a *t* test was used.

CHAPTER IV

RESULTS

The purpose of this study was to determine if there are differences in the first-year academic performance between home-schooled and traditional high school graduates in college measured by grade point average, retention, ACT test scores, and credits earned in their first year of college. Additionally, the study examined the attitudes and perceptions of admissions personnel toward the home-schooled graduate.

Phase I Samples

The samples for this study were provided by the Colorado Commission for Higher Education (CCHE) for first-time degree seeking home schooled freshman students enrolled at all Colorado four-year colleges and universities in the summer and fall terms (1998-2000). Once the home school sample was identified, CCHE provided a random sample of traditional high school graduates. The number of students participating from each group is shown in Table 1.

Table 1

Number of Home-Schooled and Traditional High School Graduates

Type of Schooling	*Sample Size*
Home Schooled Graduates	55
Traditional High School Graduates	53
Total	108

The home-schooled sample consisted of students who had graduated from a home school prior to enrolling in college. This population consisted of 55 students. The traditional high school sample consisted of students who had graduated from a traditional K-12 public, parochial, or private high school. The traditional high school graduate sample consisted of 53 students.

To determine if the groups were equivalent, a chi-square was used to test demographic differences between groups on gender, race/ethnicity (minority versus non-minority), and college or university enrolled. To determine if there was a significant difference between home-schooled graduates and traditional high school graduates by gender a 2X2 chi-square analysis was computed. The result was not significant, X^2 (1, N = 108) = .146, p = .847. As reported in Table 2, the results suggest that the proportion of females and males do not differ for those who attend home school or a traditional high school.

Table 2

Number of Home-Schooled Graduates and Traditional High School Graduates by Gender, Ethnicity, and Institutional Type

Demographic Variables	Home-Schooled (n=55)	Traditional Schooled (n=53)	X^2	p
Female	26	27	.146	.847
Male	27	26		
Minority	7	12	1.497	.310
Non-Minority	44	40		
College	32	30	.027	1.00
University	23	23		

Note: A total of five students were coded as unknown ethnicity, therefore are not identified in the above totals.

To determine whether there were differences between home-schooled graduates and traditional high school graduates in regard to race/ethnicity (minority or non-minority) a 2X2 chi-square analysis was done with the variables ethnicity and type of school attended (home-schooled and traditional high school graduates). The result was not significant, X^2 (1, N=103) = 1.497, p = .310. As shown in Table 2, these results suggest that the proportion of minority and non-minority does not differ between those who attend home-schooled and those who attend traditional schools.

To determine whether there were differences between home-schooled graduates and traditional high school graduates in regard to whether they enrolled in a college or university, a 2X2 chi-square analysis was done with the variables college or university and type of school attended (home-schooled and traditional high school). The result was not significant, X^2 (1, N=108) = .027, p = 1.00. These results shown in Table 2, suggest that home-schooled or traditional high school graduates do not differ in the type of institution attended (college or university).

Testing the Hypotheses

Nine null hypotheses were tested to determine differences between home-schooled graduates and traditional high school graduates. Hypotheses one through three were designed to test the differences in first-year academic performances between first-time college freshmen home schooled graduates and traditional high school graduates. Hypotheses four through eight tested the differences in the ACT Composite Test scores; ACT English subtest scores, ACT Mathematics subtest scores; ACT Reading subtest scores; and ACT Science Reasoning subtest scores between home school and traditional high school graduates. Hypothesis nine tested the association between the following

variables: first-year grade point average, first-year earned credit hours, first-year retention, and the ACT Composite test score. The.05 alpha level was the criterion for rejecting the nine hypotheses.

Hypothesis One

Although the mean first-year grade point average for home-schooled sample was somewhat higher (M=2.78) than the mean grade point average for traditional high school sample (M=2.59). The t test revealed that no statistically significant difference exists in the first-year grade point averages between home schooled graduates and traditional high school graduates, t (106) = .923, p = .358. The null hypothesis was not rejected.

Table 3

First-year Grade Point Average for Home-Schooled and Traditional High School Graduates

Type of Schooling	*M*	*SD*	*n*
Home School	2.78	1.049	55
Traditional High School	2.59	1.103	53
	t = .923 p = .358		

Hypothesis Two

To determine if there was a significant difference between home-schooled graduates and traditional high school graduates in first-year retention, a 2X2 chi-square analysis was computed. The result was not significant, X^2 (1, N = 108) = .130, p = .818. The results suggest that home-schooled graduates and traditional high school graduates do not differ in first-year retention in college (see Table 4). The null was not rejected.

Table 4

First-year Retention Rates between Home-Schooled Graduates and Traditional High School Graduates

Type of Schooling	Dropped Out	Retained	X^2	p
Home Schooled	13	42	.130	.818
Traditional High School	11	42		

Note: Retention was computed on students returning for the second semester of their first-year.

Hypothesis Three

The cumulative mean credit hours earned for home-schooled students was 23.85 compared to 22.69 for traditional high school college freshman. As shown in Table 5, the test revealed that there was no statistically significant difference in cumulative credit hours earned between home schooled and traditional high school college freshman, t (106) = .554, p = .581. The null hypothesis was not rejected.

Table 5

First-year Credit Hours Earned for Home Schooled and Traditional High School Graduates

Type of Schooling	*M*	*SD*	*n*
Home Schooled	23.85	11.99	55
Traditional High School	22.69	9.72	53
	t = .554 p = .581		

Hypothesis Four

The ACT Composite Test score for home-schooled graduates was 22.8 compared to 21.3 for traditional high school graduates. Table 6 shows that while home-schooled

graduates did not score significantly higher than traditional high school graduates on the ACT Composite Test score, the difference approached significance, the *t* test revealed a *t* (102) = 1.701, $p = .092$. The null hypothesis that there is not a statistically significant difference between the ACT Composite Test scores of home schooled and traditional high school graduates was not rejected as a result of this test. Although, the literature review did not support a directional hypothesis, if a one-tailed test were used the result would have been significant ($t = 1.701$, $p < .046$), and using Cohen's guidelines the effect size would be considered between small and medium, $d = .33$ (Cohen, 1988).

Table 6

ACT Composite and Subtests Scores for Home Schooled and Traditional High School Graduates

	Home-Schooled		*Traditional*			
Tests	*M*	*SD*	*M*	*SD*	*df*	*t*
[a]ACT Comp.	22.80	5.36	21.30	4.04	102	1.701
ACT English	21.36	4.81	20.00	4.73	85	1.686
ACT Math.	22.15	5.95	20.31	4.22	85	1.322
ACT Reading	22.90	6.65	21.52	5.28	85	1.898
ACT Science	23.18	4.75	21.29	4.51	85	1.076

Note: ACT[a]= includes 13 converted SAT Combined scores to ACT Test Composite Test scores.
$p > .05$ for all tests.

Hypothesis Five

The mean ACT English subtest score for home-schooled graduates was 21.36 compared to 20.00 for traditional high school graduates (see Table 6). The test revealed a *t* (85) = 1.322, $p = .190$. The null hypothesis that there is not a statistically significant

difference between the ACT English subtest scores of home schooled and traditional high school graduates was not rejected as a result of this test.

Hypothesis Six

The mean ACT Mathematics subtest score for home-schooled graduates was 22.15 compared to 20.31 for traditional high school graduates. In Table 6, similar to the ACT Composite test score, the home-schooled graduates did not score significantly higher than traditional K-12 school graduates on the ACT Mathematics subtest, but the results approached significance with the test revealing a t (85) = 1.686, p = .095. The null hypothesis was not rejected.

If a one-tailed test were used, the ACT Mathematics subtest would have been statistically significant at $p < .048$ and a .37 small to medium effect size (Cohen, 1988).

Hypothesis Seven

The mean ACT Reading subtest score for home-schooled graduates was 22.90 compared to 21.52 for traditional high school graduates. The test revealed a t (85) = 1.076, p = .285 (see Table 6). The null hypothesis was not rejected as a result of this test.

Hypothesis Eight

The null hypothesis that there was no statistically significant difference between the ACT Science Reasoning subtest scores of home schooled and traditional high school graduates was not rejected as a result of this test. The mean ACT Science Reasoning subtest score for home-schooled graduates was 23.18 compared to 21.29 for traditional high school graduates (see Table 6). The t-test revealed a t (85) = 1.898, p = .06.

Using a one-tailed test, the ACT Science Reasoning subtest would have been statistically significant at $p < .031$ with a $d = .41$ medium to small effect size (Cohen, 1988).

Hypothesis Nine

There is no correlation among the following variables: first-year grade point average, first-year earned credit hours, first-year retention, and the ACT Composite test score.

Table 7 shows statistical significant correlations were found between ACT Composite test scores and the other three variables: retention, $r\,(108) = .20, p < .039$, cumulative grade point average, $r\,(108) = .30, p < .002$, and cumulative credits earned, $r\,(108) = .40, p < .000$. Retention and cumulative credits hours earned were highly correlated, $r\,(108) = .71, p < .000$. Therefore the null was rejected for four out of the six correlations. Students ACT Composite test scores generally predicted first-year retention, first-year grade point average, and cumulative credits earned. Logically, students who are retained (return for the second semester) earn more cumulative credits hours. The effect size for the relationship between ACT and retention is considered small to medium; however, the effect size of ACT and first-year grade point average is medium and that for ACT and cumulative credit hours earned is considered medium to large (Cohen, 1988). It is not surprising that the retention and cumulative credit hours earned correlation was considered a large effect size.

Table 7

Intercorrelations for ACT Composite Test Scores, Retention, Cumulative Grade Point Average, and Cumulative Credit Hours Earned

Variables	1	2	3	4
1. ACT Composite	--			
2. Retention	.20*	--		
3. Cumulative GPA	.30*	.12	--	
4. Cumulative Credits	.40*	.71**	.16	--

Note: Coefficients are significant at $*p < .05$. $**p < .01$.
N=108.

Phase II General Home Schooling Survey Findings

A 15-item three-part questionnaire was electronically mailed (e-mailed) at the beginning of October 2001, to Admissions Personnel at 159 four-year colleges and universities in Alaska, Arizona, California, Colorado, Hawaii, Idaho, Montana, New Mexico, Nevada, Oregon, Utah, and Wyoming. The first week's email yielded a total of 29 responses. After the initial week, an email reminder was sent and an additional 16 responses were received during the second week. In the third and final week, an email reminder was sent and 11 additional admissions personnel responded. This represents a total of 55 responses for a 35% return rate.

Section I: Home School Admissions Survey

Section one of the questionnaire requested institutional demographics and characteristics for each institution. Nearly 57% of the institutions responding to the questionnaire were from state supported colleges or universities. The data in Table 8 shows that 35% of the admissions officers reported that they were private institutions and 9% were church affiliated institutions. Thus, 44% were private colleges. These

percentages are similar to 51% of the selected sample were private institutions (church and private combined), and the 49% that were public institutions.

Table 8

Survey Respondents by College Type

Institutional Type	*n*	Percent
Church Affiliated	5	9.1
Private Institution	19	34.5
State Institution	31	56.4
Total	55	100

Carnegie Classification

Institutions were asked to categorize their institutions by one of the seven Carnegie classifications for colleges and universities shown in Table 9. The three largest Carnegie types that responded to the questionnaire were Doctoral/Research Universities—Extensive at 27.3%, Master's Colleges Universities—I at 25.5% and Baccalaureate Colleges—Liberal Arts at 20% (see Table 9). The selected sample represented 36.4% Doctoral/Research Intensive and Extensive institutions compared to 27.3% in the actual sample, 41.1% were classified as master's level institutions, and 22.8% from baccalaureate level institutions. The remaining 8.8% were coded as theological, business, or engineering institutions.

Table 9

Survey Respondents by Carnegie Classifications

Carnegie Classification	*n*	Percent
Baccalaureate Colleges—General	2	3.6
Baccalaureate Colleges—Liberal Arts	11	20.0
Baccalaureate/Associate's Colleges	2	3.6
Master's Colleges and Universities I	14	25.5
Master's Colleges and Universities II	2	3.6
Doctoral/Research Universities--Extensive	15	27.3
Doctoral/Research Universities--Intensive	5	9.1
Unknown	4	7.3
Total	55	100

Campus Size

The distribution of questionnaires returned by campus size is shown in Table 10. The most respondents at 27.3% (15) were from institutions with enrollments fewer than 2,000 students. The second largest at 23.6% came from institutional enrollments between 10,000 and 19,999 students, followed closely by institutional enrollments between 2,000 and 4,999 at 21.8%. The lowest number reporting were institutions between the enrollment size of 5,000 and 9,999 at 12.7%.

Table 10

Survey Respondents by Campus Size

Institution Size	*n*	Percent
Fewer than 2,000	15	27.3
2,000 to 4,999	12	21.8
5,000 to 9,999	7	12.7
10,000 to 19,999	13	23.6
20,000 or more	8	14.5
Total	55	100

Campus Setting

Finally, respondents were asked to classify their institutions by campus setting. The distribution of respondents by campus setting is shown in Table 11. Nearly half or 43.6% of the institutions responding indicated that their institution were located in a suburban setting. Urban setting at 29.1% was the second largest response followed by rural setting at nearly the same percentage at 27.3%.

Table 11

Survey Respondents by Campus Setting

Campus Setting	*n*	Percent
Rural	15	27.3
Suburban	24	43.6
Urban	16	29.1
Total	55	100

Section II: Admissions Policy

In Section II of the Home School Admissions Survey, respondents were asked a

series of questions regarding their home school admissions policy. In the first question, admissions officers were asked: "Does your institution have an official Home School Admissions Policy?"

Forty-one or 74.5% of the admissions officers indicated that they had an official home school admission policy. The remaining 13 (23.6%) institutions indicated that they did not have an official home school admission policy. For those institutions that had an official home school admissions policy, they were asked to indicate what types of documents were required for home school graduates. Additionally, admissions officers who responded that they had an official admissions home school policy, were also asked to rank each required document by the level of importance for consideration of admission ranking the documents one being most important, eight being least important. Table 12 shows the results of their responses.

Table 12

Documents Required for Consideration for Admissions for Home School Graduates

Required Documents	Frequency	*M*	*SD*
ACT or SAT Test Scores	43	1.81	1.91
Essay	39	3.67	2.52
GED	37	3.95	2.68
Letters of Recommendation	40	4.13	2.52
SAT II (Subject Tests)	35	4.46	2.92
Personal Interview	37	4.49	2.65
Portfolio	33	4.64	2.86

Note: Mean rank with 1 being most important, 8 being least important.

The admissions officers (43) said ACT or SAT Test scores was the number one document required for admission to their institution and rated ACT or SAT Test scores as the most important (M=1.81) for consideration for admission. While 40 admissions officers indicated that letters of recommendations were required for home school admission, letters of recommendations ranked fourth for level of importance for consideration for admission among institutions. A total of 39 admissions officers required an essay for home school admission and also ranked essay second as most important for consideration for admission. Thirty-seven admissions officers required a GED test scores and personal interview for home school admissions. However, a personal interview was near the bottom for consideration of admission and a GED test score was ranked third as importance for consideration for admission of home school graduates. Thirty-three required a portfolio for admission and ranked portfolio as the least important among the grouping of documents.

Nearly one-third (29%) of the admissions officers also indicated other documents are required for admission of home school graduates. Other documents required for admission from home school graduates included a home school transcript, a GED if home school transcripts were not available, transcripts from an approved school (accredited). Also, one admission officer stated that students must meet statewide eligibility test requirements consideration. One institution indicated that they "would not consider a home school applicant unless the home school applicant had taken courses in a community college or four-year university." Another institution stated that they would "only consider a home school applicant if the home school graduate had taken community college work to validate essential course work." Finally, one institution

reported that home school applicants must demonstrate a second-language proficiency for consideration for admission, perhaps because this is required for applicants.

For those institutions that responded that they did not accept home schooled applicants, they were asked why they did not accept these graduates. A total of only four schools responded to this question. One admission officer reported that he or she did "not believe that students (home schooled) are prepared for college." Two admissions officers indicated that the lack of (high school) accreditation prohibited the acceptance of home school applicants. The fourth admission officer reported that their state policy prohibited them from accepting a home school applicant; perhaps this is due to the institutions misinterpretation of the policy given no other institution reported such a policy.

Admissions officers were asked to also define their institution's selectivity (less selective, open admission, selective, most selective). Nearly half (27) indicated that their institution's selectivity was categorized as selective. A total of 11 admissions personnel reported that their institution was highly selective and 11 also reported that their institution was less selective. Five institutions reported that their institutions were considered open admissions.

Admissions officers were asked to approximate the number of applications received from home school applicants during the most recent academic year. Table 13 shows the number of admission applications received from home school graduates.

Table 13

Number of Home School Applications Received Per Year

Applications Received	Frequency	Percent
Less than 10	24	43.6
10-29	22	40.0
30-49	6	10.9
No Response	3	5.5
Total	55	100

Nearly 95% of the institutions indicated that they had received applications from home-schooled graduates. A total of 24 institutions indicated that they received less than 10 applications from home-schooled graduates. However, 22 reported that they received between 10-29 applications from applicants from home schools. Only six or nearly 11% reported applications between 30-49 received from home-schooled high school graduates.

Section III: Attitudes and Perceptions

This section examined the perceptions and attitudes of admissions officers toward the home-schooled population. Admissions officers were asked several questions on how successful they expected home-schooled graduates to be compared to traditional high school graduates.

The first question asked admissions officers to respond to how they expected the overall success of home-schooled applicants to compare to traditional high school graduates during their first-year of college. Table 14 summarizes the results of the admissions officer's perceptions of the home-school graduates expected overall success rate compared to traditional high school graduates.

Table 14

Expected Overall Success Rate of Home School Graduates Compared to Traditional High School Graduates

Expected Success Rate	Frequency	*Percent*
Less successful	2	3.6
About the same	31	56.4
More Successful	12	21.8
No Opinion	10	18.2
Total	55	100

Approximately 56% expected home school graduates to be as successful as traditional high school graduates, and nearly 22% expected them to be more successful. Only two admissions officers expected home-schooled graduates to be less successful than traditional high school graduates. A total of 10 (18%)admissions officers did not have an opinion on the expected overall success rate of home-schooled graduates.

The next question asked admissions officers perceptions of how they would expect the first-year grade point average of home school applicants compared to traditional K-12 schooled applicants in the first year. Table 15 summarizes the responses of admissions officers' perceptions of the expected first-year grade point average of home-schooled graduates compared to traditional high school graduates.

Table 15

Expected First-Year Grade Point Average of Home School Graduates Compared to Traditional High School Graduates

Expected First-year GPA	*Frequency*	*Percent*
Less successful	3	5.5
About the same	29	52.7
More Successful	13	23.6
No Opinion	10	18.1
Total	55	100

Over half (52.7%) of the admissions officers expected the first-year grade point average of home school graduates to perform about the same as traditional high school graduates. While nearly one-fourth (23.6%) expected home school graduates to out perform traditional high school graduates.

All admission officers at church affiliated school expected home-schooled graduates to earn about the same first-year grade point average as traditional high school graduates compared to 50% and 51.6% of the private and state institution admission officers. A total of 27.8% of the admission officers at private institutions and 25.8% of the state institutions responding expected home-schooled graduates to be more successful in their first-year grade point average.

The third question in this section asked admissions personnel to rate how they expected the first-year retention rate of home-schooled graduates to compare to traditional high school graduates. Responses to this question revealed that 25 or 45.5% of the admissions officers expected home-schooled graduates to have about the same first-year retention rate as traditional high school graduates. Twenty percent expected a higher

first-year retention rate among home school graduates and 12.7% or seven expected traditional high school graduates to be retained at a lower rate than home school graduates. As shown in Table 16, 16.4% of the admissions officers did not have an opinion as to the expected first-year retention rate between the two groups.

Table 16

Expected First-Year Retention Rate of Home School Graduates Compared to Traditional High School Graduates

Expected Retention Rate	Frequency	*Percent*
Less successful	7	12.7
About the same	25	45.5
More Successful	11	20.0
No Opinion	10	16.4
Missing	3	5.5
Total	55	100

In the next question, admissions officers were asked how they expected home school graduates to compare with traditional high school graduates in the number of credit hours earned in their first-year of college. In this response, the majority (65.5%) of the admissions officers expected home-schooled graduates to earn about the same number of credits as traditional high school graduates in their first year of college. Only one admission officer expected home-schooled graduates to earn fewer credits in their first-year than traditional high school graduates. While 20% expected home-schooled graduates to earn more credits in their first-year than traditional K-12 school graduates (see Table 17).

Table 17

Expected First-Year Credits Earned of Home School Graduates Compared to Traditional High School Graduates

Expected Credits Hours	*Frequency*	Percent
Less successful	1	1.8
About the same	36	65.5
More Successful	11	20.0
No Opinion	5	9.1
Missing	2	3.6
Total	55	100

The fifth question in this section, asked admissions officers how they expected home-schooled graduates to cope socially in their first-year of college compared to traditional high school graduates. This question revealed that 43.6% of the admissions officers expected home-schooled graduates cope socially about the same as traditional high school graduates in their first-year of college. However, almost 35% (19) expected home-schooled graduates not to cope socially as well as traditional high school graduates (see Table 18).

Table 18

Expected First-Year Socially Coping of Home School Graduates Compared to Traditional High School Graduates

Social Coping	Frequency	Percent
Not as well	19	34.5
About the same	24	43.6
Better	1	1.82
No Opinion	9	16.4
Missing	2	3.64
Total	55	100

The final question in this section asked admissions officers if they would encourage home school applicants to attend a community/junior college before attending a four-year college or university. This question allowed admissions officers to provide their opinion on whether or not they would prefer graduates of home schools to start at the four-year level or seek admission to a community college first. As shown in Table 19, the majority (72.7%) of admissions officers would not encourage graduates of home schools to seek enrollment at a community college before enrolling at a four-year school. Only 16.4% answered "yes" to this question and would encourage home-schooled graduates to seek enrollment at a community college before entering their colleges or universities.

Table 19

Should Home School Graduates Enroll in a Community College Before Attending a Four-year College or University?

Encourage Two-Year Enrollment	*Frequency*	*Percent*
Yes	9	16.4
No	40	72.7
No Response	6	10.9
Total	55	100

Supplemental Analysis

In this section, supplemental analyses were conducted to examine if there were differences between rural, suburban, and urban institutions in how they expected the overall first-year success rate, and coping socially of home-schooled students to compare to traditional high school students. A second analysis was also conducted to determine if there were differences between public and private (church affiliated and private combined) institutions in how they expected the overall first-year success and coping socially of home-schooled graduates and traditional high school graduates.

To investigate whether campus setting (rural, suburban, or urban) seemed to have an effect on the expected overall success of home-schooled students compared to traditional high school students a one-way ANOVA was used. The one-way ANOVA test yielded no significant difference, $F(2,42) = 1.228$, $p = .303$.

To investigate whether campus setting (rural, suburban, or urban) seemed to have an effect on how admissions officers expected the first-year coping socially of home-schooled graduates to compare to traditional high school graduates a one-way ANOVA was used. The test revealed a statistically significant difference, $F(2,41) = 4.585$, $p =$

.016. To examine which campus settings were significant a Tukey Honestly Significant Difference (HSD) multiple comparison test was done. Post hoc comparisons using the HSD test revealed a significant difference (p = .015) between the mean score for the urban campus setting (M=1.33), and the mean score of the rural campus settings (M=1.92). This means that the rural college admission officers think that home-schooled graduates would cope socially better.

To determine if there were differences in public and private (church affiliated and private combined institutions) admissions officers expectations of the overall first-year success rate and coping socially of home-schooled students compared to traditional high school students, a t test was used. The t test for success rates revealed no statistical significance, t (43) = -.381, p = .705. The test also revealed no significant difference between public and private institutions in how they expected the home-schooled students to cope socially compared to traditional high school graduates in their first-year, t (42) = -.453, p = .653.

Summary

The data presented in this chapter were gathered by CCHE and a 15-item questionnaire. This study analyzed the first-year academic performance of home-schooled graduates and traditional high school graduates to determine if there were differences between their first-year academic performance measured by grade point average, retention, ACT test scores, and credits earned in their first year of college. Additionally, the study examined the attitudes and perceptions of admission personnel toward the home-schooled graduate.

In Chapter IV, the results of the study have been presented. Nine null hypotheses were tested and eight were not rejected; one was rejected. If a one-tailed test were used, the results of the ACT Composite test would have been significant with $p < .046$ and a .33 small effect size; the ACT Mathematics subtest would have been statistically significant at $p < .048$ and a .37 small to medium effect size; ACT Science Reasoning subtest would have been statistically significant at $p < .031$ and a .41 small to medium effect size (Cohen, 1988).

A chi-square test was used to determine if home-schooled graduates and traditional high school graduates differed on retention rates in the first year. The results of this test were also not statistically significant. The ninth hypothesis was tested to determine if a relationship existed between first-year grade point average, first-year earned credit hours, first-year retention, and the ACT Composite test score. The null was rejected. The results revealed a correlation between: ACT Composite test scores and a) retention, $\underline{r}\,(108) = .20$, $p < .039$, b) cumulative grade point average, $r\,(108) = .30$, $p < .002$, and c) cumulative credits earned, $r\,(108) = .40$, $p < .001$. Retention and cumulative credits hours earned were, as expected, highly correlated, $r\,(108) = .71$, $p < .000$ (see Table 7).

Two research questions were also examined to first determine the home school admissions policies and secondly, to examined the attitudes and perceptions of admissions officers in Alaska, Arizona, California, Colorado, Hawaii, Idaho, Montana, New Mexico, Nevada, Oregon, Utah, and Wyoming at four-year colleges and universities. The results of the first question revealed that 74.5% of the colleges and universities had an official home school admissions policy and most required the ACT or

Test Scores for consideration for admission, followed by essay and GED as the top three documents required for admissions. Reasons given why some institutions (only four) did not accept home school applicants were that they did not believe the home applicants were prepared for college, a lack of accreditation of the high school, or that institutional policy prohibited the acceptance of home school applicants.

In examining the second question, over half (55.3%) of the admissions officers expected the home-schooled graduates to perform about the same as traditional high school graduates. While 18% expected home-schooled graduates to be more successful, nearly 12% expected home-schooled graduates to be less successful. A total of 15% of the admissions officers did not have any opinion on the expected success of home-schooled graduates compared to traditional high school graduates.

It appears that while admission officers' overall attitudes and perceptions of graduates of home schools are favorable, admission officers' attitudes and perceptions around home-schooled graduates ability to cope socially are not as favorable. More than one-third (35%) of the admission officers expected first-year home-schooled graduates not to socially cope as well as traditional high school graduates. Only one admission officer expected home-schooled graduates to socially cope better than traditional high school graduates. Another 43.6% of the admissions officers expected home school graduates to socially cope about the same as traditional high school graduates.

In the supplemental analysis no significant differences was found between campus settings (rural, suburban, urban) in how they expected home-schooled students to perform overall academically; however, there was a significant difference found between the campuses based on settings and how they expected home-schooled graduates to cope

socially in their first-year of college compared to traditional high school graduates. A Tukey post-hoc comparison revealed a significant difference between admissions officers at rural campuses and admissions officers at urban campuses. Admissions officers at rural campuses expected home-schooled graduates to cope socially about the same as traditional high school graduates, while more admissions officers at urban institutions expected home-schooled graduates to be less successful in coping socially than traditional high school graduates in their first-year.

There was no significant difference found in how public and private institutions expected the home-schooled graduate to cope socially or overall first-year success in their first-year compared to traditional students.

CHAPTER V

DISCUSSION

According to recent studies, nearly two percent or approximately 850,000 American children are being taught at home. The number of parents choosing this option is expected to be growing at a rate between 7-15 percent annually. Val Galen & Pitman (1991) identified two categories of home schoolers "ideologues" and "pedagogues". The ideologues are primarily Christian fundamentalist families and are interested in their children learning the "Christian doctrine" as well as understanding that the "family is the most important institution in society" (p. 67). Ideologues adamantly believe that it is their responsibility and right and not the school's responsibility to teach their children. The second group of families who chose home schooling were categorized as "pedagogues" and were described as those who taught for pedagogical reasons. These families believed that the schools were inept for their children.

The purpose of this study was to determine if there were differences in the first-year academic performance between home-schooled and traditional high school graduates in college measured by grade point average, retention, ACT test scores, and credits earned in their first year of college. Additionally, the study examined the attitudes and perceptions of admission personnel toward the home-schooled graduate.

Summary of Findings and Discussion

Summary of Hypotheses

There were nine hypotheses tested in this study. The first eight were not rejected; hypothesis nine was rejected.

The first hypothesis stated that there is no significant difference between first-year grade point average (GPA) of home-schooled and traditional high school graduates. While the mean GPA was somewhat higher for the home-schooled students, no statistical significance existed and the null was not rejected. This was similar to the findings in Gray's (1998) study. Home-schooled students had a higher GPA than traditional high school graduates, but the difference was not significant. However, Jenkins (1998) found that home-schooled graduate's first-year grades were significantly higher than traditional high school graduates. Gray (1998) found that home-schooled students and traditional high school graduates had a similar first-year grade point average; however, the mean grade point average of home-schooled students was somewhat higher just as in this study.

Hypothesis two stated that there are no differences between home-schooled graduates and traditional high school graduates on whether they are retained in college during their first year (fall to spring semester). No statistical significance was found. No literature was found that examined first-year retention of home-schooled students; however, given that home-schooled students performed overall as well as traditional high school students, one might speculate that attrition would not be due to academic difficulty.

Hypothesis three stated that there is no significant difference between first-year credit hours earned between home-schooled and traditional high school graduates. No

statistical significance was found. Although not statistically significant, home-schooled students earned somewhat higher credit hours in their first-year than traditional high school graduates. Unfortunately, the literature on post-secondary home school issues did not reveal any studies that examined credit hours as a variable in their studies.

Hypothesis four stated that there is no significant difference in the ACT Composite scores between home-schooled and traditional high school graduates. Home-schooled graduates' mean ACT Composite test score was somewhat higher than traditional high school graduates but not significantly higher. If a directional one-tailed hypothesis test was used, a statistical difference existed. Galloway (1995) and Gray (1998) found similar results that were not significant in their studies in examining the ACT Composite test score between home-schooled graduates and traditional high school graduates.

Hypothesis five stated that there is no significant difference in the ACT English test scores between home-schooled and traditional high school graduates. No significant difference was found. In Galloway's (1998) study, home-schooled students scored significantly higher than conventional private high school graduates.

Hypothesis six stated that there is no significant difference in the ACT Mathematics test scores between home-schooled and traditional high school graduates. Results of this test approached statistical significance. However, if conducting a directional one-tailed test, home-schooled students scored significantly higher on the ACT Mathematics subtest than traditional high school graduates with a small to medium effect size (Cohen, 1988).

Hypothesis seven stated that there is no significant difference in the ACT Reading test scores between home-schooled and traditional high school graduates. Although the mean ACT Reading subtest score for home-schooled students (22.90) was higher than traditional high school graduates (21.52), no significant difference was found between the groups.

Hypothesis eight stated that there is no significant difference in the ACT Science Reasoning test scores between home-schooled and traditional high school graduates. Again, while statistical significance was not found, when conducted as a directional one-tailed hypothesis test, statistical significance was found with a medium to small effect size (Cohen, 1988).

Finally, hypothesis nine stated that there is no correlation among the following variables: first-year grade point average, first-year earned credit hours, first-year retention, and the ACT Composite test score. For this hypothesis, significant relationships were found between ACT Composite test scores and first-year grade point average, retention, and cumulative credits earned. Not surprisingly, there was also a strong correlation between cumulative credits earned and retention.

Discussion of Survey Findings

Based on the data gathered from the 15-item survey, the following findings were presented:

The first research question asked about admissions officers' about admissions policies of home-schooled graduates. Nearly three-fourths (75%) of the colleges and universities had an official home school admissions policy. In Barnebey's (1986) study from more than 15 years ago, it was found that over 90% of the institutions did not have

an official home school admissions policy. Jenkins (1998) found that only 47% of the community college admissions officers surveyed had an official admission policy for home-schooled graduates.

The ACT or SAT test was found to be the most preferred item utilized for consideration for admission followed by an essay or GED test score. Similar results were found in the Jenkins and Barnebey studies, although 97% of the admissions officers in Barnebey's study stated that high school grades were a standard requirement. Jenkins's study also revealed that no community college admissions officer reported that they would require an essay for admissions.

The final research question asked about the attitudes and perceptions of admissions personnel toward the home-schooled graduate population. The findings in this section of the study were consistent with studies presented in Chapter II.

Overall, more than half (55%) of the admission officers surveyed expected home-schooled graduates to perform about the same as traditional high school graduates (overall success rate, first-year grade point average, retention rate, credit hours earned, and social coping); 18% expected home-schooled graduates would be more successful; and nearly 12% expected home-schooled graduate would be less successful. Jenkins' (1998) study found that not as many community college admission officers expected home school student's to be as successful (36%) as traditional high school graduates; however, 27% of the admissions officers expected home schooled students to be more successful than traditional high school graduates, and only 5.7% expected home schooled students to be less successful than traditional high school graduates. Barnebey's (1986) study found that nearly 46% of the admission officers that accepted home schooled

applicants expected them to be as successful, 4.5% more successful; however, 50% expected home-schooled students to be less successful.

The study revealed that only 16.4% of the admissions officers would encourage home-schooled students to attend a community college or junior college prior to attending a four-year institution. This compares to 65.5% of the admission officers in Barnebey's (1986) study who stated that they would encourage home-schooled applicants to attend a junior/community college before applying to a four-year institution.

Implications for Practice

Colleges and universities may not only want to ensure that they have a home-school friendly admission policy in place, but they should actively recruit these students to their institutions. With these favorable results for home-schooled students, one could conclude that the home-schooled graduates will ultimately do as well as their public school peers in their first-year of college in regards to grade point average, credits earned, and retention.

Secondly, state policy makers should also ensure that admissions policies of public college's and university's guarantee that home-schooled graduates receive equitable access to institutions of higher education. Admission officers should also remove any unnecessary barriers or additional requirements (i.e., requiring a GED in addition to a home school transcript) for home-schooled graduates, which would mean giving recognition to the home-schooled graduate transcript. Some schools have different admission standards for home-schooled students and this study suggests that such differential treatment is unwarranted. This study as well as similar studies on home-schooled graduates (Galloway, 1995; Jenkins, 1998) indicates that the ACT Composite

test score is a reliable predictor for admission and first-year academic success in college for home-schooled graduates.

Finally, with the findings of this study indicating that home-schooled graduates perform academically as well as their traditional high school peers in their first-year of college, home school families should use these results to pursue or advocate for admission policy changes. Home school families should also use the results of this study to promote a more positive image and perception in value of home schooling high school age students.

Recommendations for Future Research

Studies related to home-schooled students have increased over the past decade; however, many of these studies have continually focused on the K-12 level. Recent studies conducted at the post-secondary level demonstrate the need for additional research at this level (Donahue, 2001; Jenkins, 1998). The following research recommendations are suggested in order to continue to close the gap in the literature on home-schooled graduates at the post-secondary level:

First, a replication of this study with a larger sample in other regions of the country to examine the performance of home-schooled graduates at the post-secondary level should be conducted. It was anticipated at the beginning of this project that a much larger sample would be found; however, due to the issue of how home-schooled students were coded at some of the four-year institutions led to a smaller sample.

Second, a longitudinal study on the performance of home-schooled graduates in college measuring graduation outcomes should be conducted. Most of the studies that

were found at the post-secondary level focused on the performance of home-schooled graduates in the first-year of college.

Third, a qualitative study examining how home-schooled graduates and their families experience the admissions process should also be explored. As stated in the researcher's background, the researcher has several friendships with home school families. A lot can be gained by exploring how these families experience the admissions process, which could provide a significant contribution to admission officers.

Fourth, a total of 16% of the home-schooled graduates were minority students in this study. This percentage is not consistent with the literature; Ray's (1997) study found that only four percent of the home school families were minority families, a later study by Ray (1999) indicated that nearly 10% of the home school families were minority families. With the growth of minority home-schooled graduates, a study should be conducted on the academic achievement of minority home-schooled graduates compared to minority traditional high school graduates.

Fifth, a study of home-schooled graduates who first attend community college and how they experience the transition to four-year colleges and universities should be conducted. This study found that 16% of the admission officers indicated that they would encourage home-schooled graduates to attend a community or junior college prior to attending a four-year college. A tremendous contribution could be made to the body of literature in understanding how these students experience the transition to the four-year college.

Finally, with nearly 35% of the admissions officers not expecting home school graduates to cope as well socially as traditional high school graduates, studies should be conducted to examine how home school applicants socially cope in college.

Conclusions

This study concludes that families who home school their children should not feel that the education they are providing is inferior to the traditional K-12 education of their neighborhood peers. Although not statistically significant, the mean first-year grade point averages, credits earned in the first year, ACT Composite test scores, and ACT English, Mathematics, Reading, and Science and Reasoning subtests for home-schooled graduates were all higher than traditional high school graduates. Although the sample was relatively small, the ACT Composite test score results for home-schooled graduates in this study was a mean average of 22.8, which matched identically to the national average in 2000 for home-schooled students (ACT, 2000). The national average for all students in 2000 was 21, which was nearly identical to the mean of 21.3 for the traditional high school graduate in this study. The results of the academic performance of this study clearly indicate that home-schooled graduates are as ready for college as traditional high school graduates and that they perform as well on national college assessment tests as traditional high school graduates. The results of this study are also consistent with other studies on the academic performance of home-schooled students compared to traditional high school graduates (Galloway, 1995; Gray, 1998; Jenkins, 1998; Mexcur, 1993). These results also suggest that parents guiding the K-12 academic education experience of their children does not have a negative effect on the academic outcome of their children once they enter college.

Overall, the attitudes and perceptions of admissions officers were favorable toward the expected success of the home-schooled graduate. Over seventy-three percent of the admissions officers anticipated that home-schooled graduates would be as successful or more successful in their first-year of college. While most colleges and universities in this study indicated that they had an official home-school admission policy, doctoral (85%), state (80%) and church affiliated institutions (80%) with enrollments between 10,000-19,999 (92%) in rural (86.7%) settings seemed more favorable to the home-school applicants.

The results of the overall perceptions and attitudes of admissions officers appeared to be in direct line with the overall performance of home-schooled students. The results of the academic performance of home-schooled graduates in Colorado four-year institutions revealed that the home-schooled graduate performed as well academically as the traditional K-12 graduate.

This study revealed that nearly 11% of the institutions received between 30-49 applications each year from home-schooled applicants, 40% received between 10-29 applications, and nearly 44% received less than 10 applications each year. In contrast, Barnebey (1986) found that (92%) of the colleges and universities and Davis (2000) found that only one college predicted increases in applications from home-schooled applicants. This may indicate that either colleges or universities are not coding student properly or that home-schooled graduates are opting to take the GED test instead of fighting the institutions admissions policies.

This researcher also found that 33 institutions indicated they require home-schooled graduates to submit a portfolio for admissions; 37 required a personal interview

and GED; 35 required the SAT II subject tests; and 40 required home-schooled students to submit letters of recommendation for consideration for admission. This might indicate that admission officers maybe requiring home-schooled graduates to jump through more "hoops" for admission than traditional high school graduates. Therefore, home-schooled graduates maybe opting for fewer "hoops" to jump through and are applying to and attending the community college first prior to applying to the four-year college or university.

Finally, this study provides a much-needed body of knowledge on the academic performance of home-schooled graduates and on the attitudes of admissions officers toward the home-schooled graduate. With the anticipated continued growth in the home school population, state policy makers, home school advocates, and the families who educate their children at home should also benefit by the results of this study.

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Appendix A

Colorado Commission on Higher Education Approval

STATE OF COLORADO

Department of Higher Education
COLORADO COMMISSION ON HIGHER EDUCATION

Ralph J. Nagel, Chair
Raymond T. Baker
Terrance L. Farina
Marion S. Gottesfeld
David E. Greenberg
Robert A. Hessler
Peggy Lamm
Dean L. Quamme
James M. Stewart
William Vollbracht

Bill Owens
Governor

Timothy E. Foster
Executive Director

As a doctoral student, I am requesting access to CCHE's data files in accordance with CCHE's Information Policy, specifically the enrollment data file to study the enrollment and performance patterns of home-school students.. The data will be used exclusively for educational purposes and I agree to destroy the file when it is no longer needed.

I have read CCHE's Information Policy, Section 2.00 that describes the conditions and uses of data and understand receipt of this data binds me to CCHE's Privacy Policy. I agree to all conditions described in this policy and will share the results of my study with the Commission..

Paul Jones

12/11/00
Date

Data file prepared by: Patricia Chase Riley
Data file transmitted: December 1, 2000

Approved:
Director, Academic & Student Affairs
12/1/00

1380 LAWRENCE STREET, TWELFTH FLOOR, DENVER, COLORADO 80204 • (303) 866-2723 • FAX # (303) 866-4266
www.state.co.us/cche

Appendix B

Permission to Modify Survey

From: "Toni Jenkins" <TJenkins@CCCCD.EDU>
To: <jonesp@mesastate.edu>
Date: 5/23/01 4:34PM
Subject: Re: Survey Permission Request

Paul,

You have my permission to replicate part of the survey I used in my dissertation. I would appreciate it if you would send me a copy of your findings. Good luck with your dissertation! It is worth the time, energy and sacrifices you are now making.

Toni

Dr. Toni P. Jenkins
Executive Vice-President
Collin County Community College District
4800 Preston Park Blvd.
Plano, TX 75093
(972) 758-3892

>>> "Paul Jones" <jonesp@mesastate.edu> 05/23/01 11:15AM >>>
May 23, 2001

Collin County Community College
Dr. Toni Jenkins
Executive Vice President
2800 E. Spring Creek Parkway
Plano, TX 75074

Dear Dr. Jenkins:

I'm a doctoral student at Colorado State University and will be conducting a study on the academic performance of home schooled students in Colorado. Additionally, I will be surveying college admissions officers throughout the western U.S. to examine their perceptions and attitudes toward to home school population.

In reviewing your study on The Performance of Home Schooled Students in Community Colleges, I'm requesting your permission to replicate a portion of your admissions survey instrument. This will allow me the opportunity to compare some of my results with your findings of your study.

For your convenience, you may grant permission by simply responded to my email or by mail. If you choose to mail, my address is 2328 S. Rim Drive, Grand Junction, CO 81503. You may also contact by phone at 970-261-2486.

Thanking you in advance for your support!

Sincerely,

Paul Jones
Colorado State University

Dissertation Advisor: Dr. Gene Gloeckner

Appendix C

Survey Questionnaire

HOME SCHOOL ADMISSIONS SURVEY

SECTION I: Institutional Characteristics

1. Please check the appropriate category that describes your institution:
   Institution Type:
   ___State institution
   ___Private Institution
   ___Church Affiliated Institution

2. Please check the appropriate category that describes your institution:
   Carnegie Classification:
   ___Doctoral/Research Universities—Extensive
   ___Doctoral/Research Universities—Intensive
   ___Master's Colleges and Universities I
   ___Master's Colleges and Universities II
   ___Baccalaureate Colleges—Liberal Arts
   ___Baccalaureate Colleges—General
   ___Baccalaureate/Associate's Colleges

3. Please check the appropriate category that describes your institution:
   Institution Size:
   ___Fewer than 2,000
   ___2,000 to 4,999
   ___5,000 to 9,999
   ___10,000 to 19,999
   ___More than 20,000

4. Please check the appropriate category that describes your institution:
   Campus Setting:
   ___Urban
   ___Suburban
   ___Rural

SECTION II: Home School Admissions Policy

5. Does your institution have an official Home School Admissions Policy?
   ___Yes ___No

6. If yes, what documents are required for home school graduates? Please rate the level of importance 1-8 (1 being most important, 8 being least importance) for consideration of admission.
   ___Portfolio
   ___ACT or SAT Test Scores
   ___Essay
   ___SAT II
   ___GED
   ___Letters of Recommendation
   ___Personal interview
   ___Other - Please specify_____

7. If you do not accept home schooled applicants, please check why.
   ___Lack of accreditation (school)
   ___State admissions policy prohibits admission
   ___Institutional policy
   ___Don't believe students are prepared for college

8. How would you define your institution's admissions selectivity?
___Most selective ___Less selective
___Selective ___Open Admissions

9. Approximately how many applications did you receive from home-schooled graduates during the most recent academic year?
___Less than 10 ___10 to 29
___30 to 49 ___More than 50

SECTION III: Attitudes and Perceptions

10. How would you expect the overall success rate of home-schooled applicants to compare with students who graduated from a traditional educational setting? Home schooled students will be:
___About the same ___Less successful
___More successful ___Unknown/No opinion

11. How would expect the first-year grade point average of home schooled applicants to compare with students who graduated from a traditional educational setting? Home schooled student's first-year grade point average will be?
___About the same ___Lower
___Higher ___Unknown/No opinion

12. How would you expect the first-year retention rate of home-schooled applicants to compare with students who graduated from a traditional educational setting? Home-schooled student's first-year retention rate will be?
___About the same ___Lower
___Higher ___Unknown/No opinion

13. How would you expect home school applicants to compare with students who graduated from a traditional educational setting in the number of first-year credits earned? Credit hours earned by home schooled students will be?
___About the same ___Lower
___Higher ___Unknown/No opinion

14. How do you expect home school applicants to socially compare with students who graduated from a traditional educational setting? Socially, home schooled students will cope with college?
___About the same ___Not as well
___Better ___Unknown/No opinion

15. Would you encourage home school applicant's to attend a community/junior college before attending a four-year college or university?
___Yes
___No

Appendix D

Cover Letter

October 2001

Name
Electronic Address

Dear:

I am a doctoral student in the School of Education at Colorado State University and Gene W. Gloeckner Ph.D. is my adviser. The title of my research project is First-year College Performance: A Study of Home-Schooled Graduates and Traditional High School Graduates. The primary purpose of my study is to analyze the academic performance of home school graduates who are enrolled in Colorado four-year colleges and universities. Additionally, I'm conducting a survey to examine the home school admissions policies of colleges and universities and to examine the perceptions and attitudes of admissions officers toward home school graduates.

Your voluntary participation is vital to this study and to our profession. As you probably know, there is very little research available to the profession on outcomes of home school students in college or on the perceptions and attitudes of college admission officers towards the home school population.

Your responses to this study will be kept strictly confidential. Of course, you may elect not to respond to any survey item that you are not comfortable with. To complete this 15-item web-based survey, please log into http://www2.mesastate.edu/pjones. You may also mail your survey in care of Becky Stone, 1100 North Avenue, Grand Junction, CO 81501 or fax it to Becky Stone at (970) 248-1464. Regardless of the method of transmittal you select, all identifying information will be removed before the data is given to the researchers. Up to four email reminders will be sent. Should you choose not to participate, please return your survey incomplete (via email, fax, etc.) and we will remove your name from the mailing list.

Please return the survey by **October 19, 2001**. If you have any questions or concerns regarding this research project, please contact me by telephone or by email listed below.

Thank you, in advance, and I look forward to your response to this project.

Sincerely,

Paul A. Jones
Dean of Enrollment Management
Mesa State College
970) 248-1127
970) 248-1464 (fax)
jonesp@mesastate.edu

Gene Gloeckner, Ph.D.
Assoc. Professor & Advisor
Colorado State University
970) 491-7661 (office)
ggloeckner@cahs.colostate.edu

Appendix E

Human Subjects Approval

Colorado State University

Office of Regulatory Compliance
Office of Vice President for Research
and Information Technology
Fort Collins, CO 80523-2046
(970) 491-1563
FAX: (970) 491-2293

MEMORANDUM

TO: Gene Gloeckner, School of Education, 1588
FROM: Celia Walker, Administrator for the Human Research Committee
SUBJECT: **PROJECT APPROVAL**
Title: First-Year College Performance: A Study of Home Schooled Graduates and Traditional High School Graduates.
Protocol No.: 01-228H
Funding Agency: N/A
Funding Agency Deadline: N/a
DATE: August 24, 2001

I am pleased to inform you that the above-referenced project was approved by the Human Research Committee on August 23, 2001 for the period August 23, 2001 to July 26, 2002. Because of the nature of this research, it will not be necessary to obtain a signed consent form. However, all subjects must receive a copy of the approved cover letter printed on department letterhead. The requirement of documentation of a consent form is waived under § _ _.117 (c) (2) with the return of the approved survey. **Approval is for 300 students- Part I; 500 Admission Officers- Part II.**

A status report of this project will be required within a 12-month period from the date of approval. You will be sent a reminder approximately two months before the protocol expires. The Principal Investigator will report on the numbers of subjects who have participated this year and project-to-date, about problems encountered, and provide a verifying copy of the consent form or cover letter used. The necessary form (H-101) is available from the Regulatory Compliance web page (see below). Should the protocol not be renewed before expiration, all activities must cease until the protocol has been re-reviewed.

It is the responsibility of the investigator to immediately inform the Committee of any serious complications, unexpected risks, or injuries resulting from this research. It is also the investigator's responsibility to notify the Committee of any changes in experimental design, participant population, or consent procedures or documents. This can be done with a memo which completely describes the changes and their consequences (new consent form or cover letter, or altered survey instrument, for example). Students serving as Co-Principal Investigators may not alter projects without first obtaining PI approval. The PI is ultimately responsible for the conduct of the project.

This approval is issued under Colorado State University's OHRP Federal Wide Assurance 00000647 issued July 1, 2001. If approval did not accompany a proposal when it was submitted to a sponsor, it is the researcher's responsibility to provide the sponsor with the approval notice.

Please direct any questions about the Committee's action on this project to me for routing to the Committee. Additional information is available from the Regulatory Compliance web site at www.research.colostate.edu/regulatory/

Attachment

xc: Paul Jones w/attachment