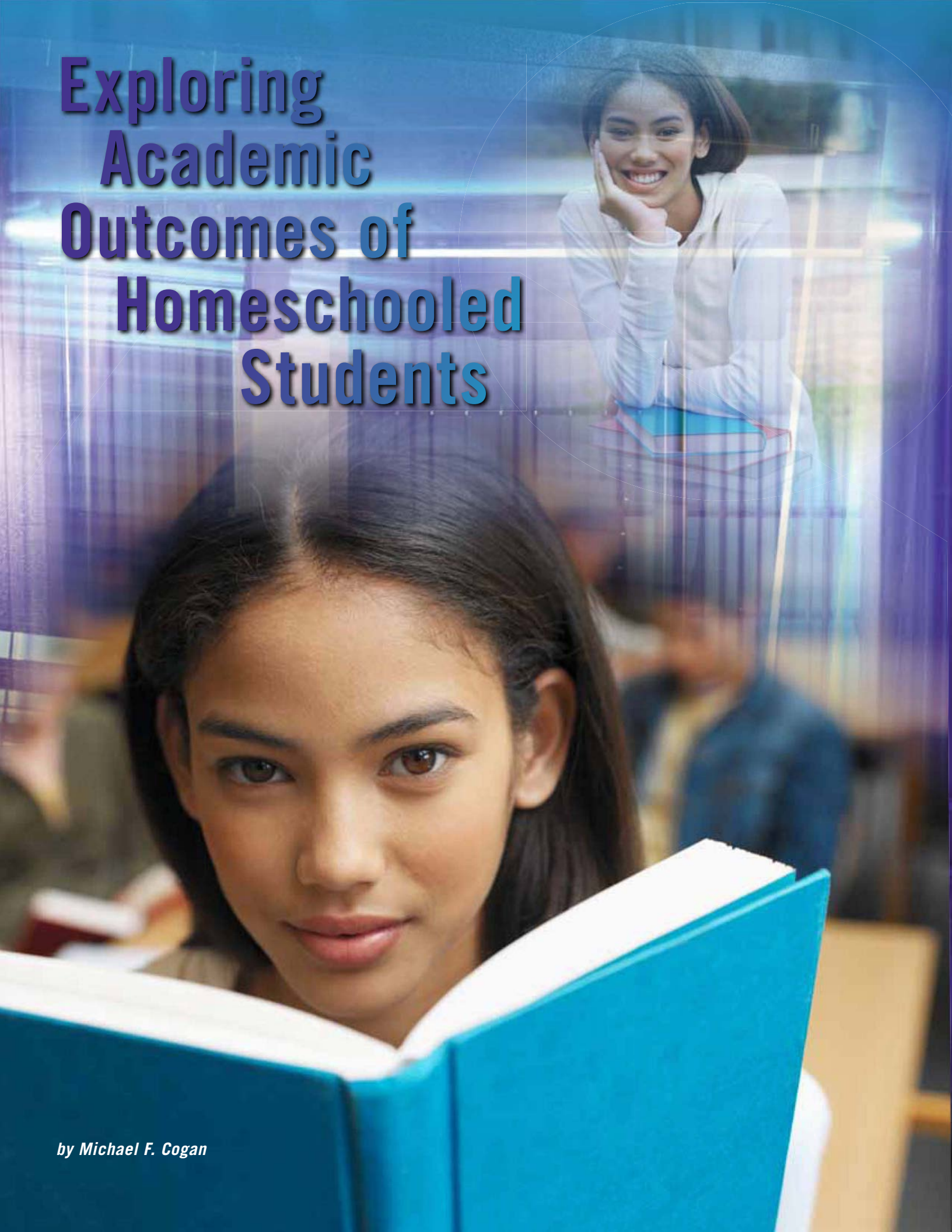
Exploring Academic Outcomes of Homeschooled Students



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Abstract

This exploratory study examines the academic outcomes of homeschooled students who enter a medium size doctoral institution located in the Midwest. Descriptive analysis reveals homeschool students possess higher ACT scores, grade point averages (GPAs) and graduation rates when compared to traditionally-educated students. In addition, multiple regression analysis results reveal that students who are homeschooled earn higher first-year and fourth-year GPAs when controlling for demographic, pre-college, engagement, and first-term academic factors. Further, binary logistic regression results indicate there is no significant difference between homeschooled student's fall-to-fall retention and four-year graduation rates when compared to traditionally-educated students while controlling for these same factors.

Introduction

Homeschooling is a type of education which typically occurs in the home with the child's parent or guardian serving as the primary educator. Prior to the advent of compulsory education in the 1700s, homeschooling was the primary form of education of the masses as the concept of hiring a teacher or tutor was available only to the elite (DiStefano, Rudestam and Silverman 2004). In the United States, compulsory education laws were adapted by nearly every state by the early 1900s. In essence, these compulsory laws decreased the number of homeschooled students dramatically as many states determined homeschooling was a controversial form of education and in many cases illegal (Knowles, Muchmore and Spalding 1994).

In the 1970s, it was estimated there were 13,000 K-12 students receiving their education through a homeschooling format in the United States (Lines 1991). Currently, homeschooling is legal in all 50 states and is considered to be one of the fastest growing segments of K-12 education in the United States (Ray 2009). The National Center for Education Statistics (Bielick 2008) recently released an estimate indicating the number of homeschooled students between the ages of 5 and 17 has increased from 800,000 in 1999 to 1,508,000 in 2007. This represents an 88 percent increase in the number of homeschooled students in the US during this period. Based on these estimates, homeschooled students represent approximately 3 percent of children attending K-12 in the US. As a group, the population of homeschooled students in the US is nearly as much as the population of students in New York City and Los Angeles combined (US Department of Education 2008) One of the few estimates related to the college school attendance patterns of homeschooled students comes from the Higher Education Research Institute (HERI) Cooperative Institutional Research Program (CIRP) survey. This instrument includes a question asking the respondent to indicate the type of high school they graduated from. This question has been included in the CIRP instrument eight of the past 18 years (2008, 2007, 2005, 2004, 2001, 1998, 1993, and 1991). HERI estimated there were approximately 11,500 freshman students who graduated from a homeschool (0.08 percent) and subsequently enrolled in one of the 1,693 institutions participating in the CIRP in 2008 (Pryor, et al. 2008).

There is a paucity of current research related to the outcomes of homeschooled students in higher education. In part, this lack of understanding is due to the relatively small number of homeschooled students known to have attended college. Additionally, higher education may not have felt a need to address the issue as the dramatic increase of homeschoolers is at the K-12 level and many of these students have yet to enter post-secondary education. In 2004, *The Journal of College Admission* dedicated a full issue to the topic of homeschooled students entering higher education. One article focused on the perceptions of admission officers tasked with admitting homeschooled students (Jones and Gleckner 2004). The authors collected survey information from 55 admission officers primarily located in the western United States. The authors found that the majority of admission officers believed homeschooled students would perform (GPA, credits earned, retention) at or above the level of traditionally homeschooled students; however, nearly 35 percent indicated homeschooled students would have a more difficult time socially when compared to their traditional peers. In the same issue, Ray (2004) found homeschooled students achieved higher standardized test scores (e.g., ACT) compared to traditional-school students. In addition, the results indicated gender, family income and parent education level had little effect on these test scores. The author continued by describing what he believed to be misconceptions related to the socialization skills of students attending a homeschool.

Every homeschooler has huge dreams because of the freedom to imagine without the discouragement of official red tape and negative peer pressure, yet those dreams are often shattered when these same individuals apply to college and hit financial brick walls.

The author highlighted this point with the following statement:

> *Experience and anecdotes have led many people to believe that homeschool parents were either move-to-the-country anarchist goat herders, or right-wing Bible thumpers, and their children were either mathematically-limited, due to Mama's fear of math, or child prodigies in rocket-science who were unthinkably socially hindered.*

In response, Ray (2004) conducted a study in which 7,306 adults who had been homeschooled completed a survey in order to determine their community and civic engagement patterns. The author concluded that students who had been homeschooled for seven or more years (N=5,254) were more likely to have earned college credit, participated in community service, and voted in the past five years when compared to the general population in the United States (Ray 2004).

Sheffer (1995) addresses the issue of socialization related to homeschool students in her work focusing on women's psychology and child development. She states:

> *They have talked about trusting themselves, pursuing their own goals, maintaining friendships even when their friends differ from them or disagree with them. Finally, those home-educated girls maintain their self-confidence as they pass into womanhood.*

The National Education Association asserts that homeschooling "cannot provide the student with a comprehensive education experience" (2007–08 NEW Resolutions document). This perception has led to the creation of several organizations dedicated to the education of homeschooled students. One such organization is Patrick Henry College (VA). This institution was established in 2000, in part, to serve Christian homeschooled students. Senior administrators estimate that approximately 85 percent of the student body was homeschooled prior to enrolling at the college. Little is known of this group concerning academic outcomes as the institution is not required to participate in the Integrated Postsecondary Education Data System (IPEDS) reporting since they do not receive federal funding. The college has received much attention from the media since its inception due to a conservative approach, religious nature and lack of diversity. (JBHE 2001; Kirkpatrick 2007; Buncombe 2004). An article in the *New Yorker* is one example in which homeschool students are characterized by the media concerning socialization:

> *Homeschoolers are not the most obvious raw material for a college whose main mission, since its founding, five years ago, has been to train a new generation of Christian politicians. Politics, after all, is the most social of professions, and many students arrive at Patrick Henry having never shared a classroom with anyone other than their siblings. In conservative circles, however, homeschoolers are considered something of an élite, rough around the edges but pure in their focus, capacity for work, and ideological clarity a view that helps explain why the Republican establishment has placed its support behind Patrick Henry, and why so many conservative politicians are hiring its graduates* (Rosin 2005).

Recently, an institutional study attempting to describe the academic outcomes of homeschooled students was conducted at Wheaton College (IL) (Saunders 2009). The author reported that 10 percent of the student body is homeschooled. The researcher developed a statistical model in order to predict whether a student intended to return to the institution for their sophomore year or not. One of the independent variables in the model was school type. This variable was designed to identify whether school type contributes to a retention model designed to predict academic outcomes. The author concluded that the type of school attended was not a statistically significant predictor; however, the author relied on the students' expressed intent to return to the institution rather than the actual attendance patterns of the respondent.

As stated earlier, the literature surrounding homeschooled student's academic outcomes in college is incomplete. Currently, very little is known concerning the short-and long-term outcomes of this group from an empirical perspective. Sufficient evidence does exist that homeschooled students do achieve higher standardized test scores than traditionally schooled students (Ray 2004; Rudner 1999; Wartes 1991). The evidence is decidedly absent concerning homeschool student grade attainment, persistence and completion rates once they enter the postsecondary environment.

Purpose

The purpose of this research is to explore the academic outcomes of students attending homeschool prior to their enrollment at the focus institution. More specifically, homeschooled students will be compared to their non-homeschooled peers in order to determine similarities and differences between the groups. In addition, students who were homeschooled prior to enrollment will be entered into four existing regression models as a categorical variable (yes/no). The addition of this categorical variable will provide the researcher with evidence to support or refute anecdotal evidence related to homeschool students attending the focus institution.

Population

The institution participating in the study is a medium-sized private university with a Carnegie Classification of doctoral. The institution is located in a metropolitan area in the upper Midwest. The overall student population is nearly 11,000 with approximately 57 percent classified as undergraduates. Each fall, the institution enrolls a freshman class of approximately 1,320 students. The institution maintains a comprehensive data warehouse with a census file created on the 10th day of the semester. The majority of data used in this study was extracted from this census file. In order to answer the aforementioned questions, three datasets were developed. The first dataset consists of all incoming freshman students entering the institution during the fall semester between 2004 and 2009 (N=7,776). This dataset contains 76 students (approximately 1.0 percent) who reported attending homeschool prior to enrollment. This dataset will be used to describe student characteristics by high school type. The second dataset includes the same group of students entering the institution between 2004 and 2008 (N=6,424). The 2009 class was excluded from this dataset as students had yet to complete a full year at the institution at the time of the study. As such, this group will not have the requisite dependent variables (first-year GPA and fall-to-fall retention). Due to missing data, 5,505 (86 percent) of the observations were used to address first-year GPA and fall-to-fall retention outcomes. This dataset contains 70 students (approximately 1.3 percent) who reported attending homeschool prior to enrollment. The third dataset included all incoming freshman students entering the institution during the fall semester in 2004 and 2005 (N=2,488). These groups were selected as they possess the two dependent variables necessary for the analysis (four-year cumulative GPA and four-year graduation rate). Due to missing data, 2,070 (83 percent) of the observations were used to address fourth-year GPA and four-year graduation outcomes. This dataset contains 27 students (approximately 1.3 percent) who reported attending homeschool prior to enrollment.

Limitations

As mentioned in the previous section, the homeschooled student population used in this study attended a single institution. Additionally, the number of homeschool students is relatively small. As such, the results of this analysis should not be considered inferential to the general population of undergraduate students in the US. Rather, the results of this research should be considered a starting point in order to better understand academic outcomes of homeschool students entering postsecondary education.

Variable Selection

Dependent Variables

The focus institution maintains a clear goal of graduating students who enroll at the institution as freshmen. As such, senior administrators pay close attention to four academic outcome measures to include first-year GPA, fourth-year GPA, fall-to-fall retention, and four-year graduation.

The first outcomes of interest are first-year and fourth-year GPA. When considering grades, Pascarella and Terenzini (2005) state, "Even given their limitations, however, college grades may be the single best predictors of student persistence, degree completion, and graduate school enrollment. Grades are one of the most consistent predictors of these outcomes in both large, nationally representative studies and in far more numerous single institution studies." This has been supported at the focus institution as students who persist tend to maintain higher GPAs when compared to those who do not persist. For example, freshman students returning for their second year maintained a first-year GPA of 3.12 compared to a 2.51 for those who did not return. In addition, students graduating in four years tend to maintain higher GPAs (3.39) than those who graduate in five or more years (2.84). Therefore, it is essential to isolate factors that may influence these quantitative variables.

The second outcomes of interest are the persistence and degree attainment measures. Bean (2005) has developed a significant body of knowledge indicating that institutional fit or institutional commitment are critical components when considering a student's decision to continue at the institution or leave. Pascarella and Terenzini dedicate a section to the plethora of research emphasizing the positive relationship between social interaction and the student's decision to persist at the institution. The authors conclude their review by stating, "It seems clear that various forms of academic and social engagement are central elements in the persistence decision-making process (2005)." As such, understanding the influence pre-college and first-term factors have on persistence and completion is critical to understanding and improving academic success. The persistence and completion definitions provided by the National Center for Education Statistics are useful for understanding the persistence and completion patterns of the study population. In this case, the variable is dichotomous in nature with success and failure serving as the two values of interest. As such, students who are retained from their first fall to the following fall (88 percent) and those students graduating in four-years (58 percent) are considered successful (1). Those who do not return the following fall or do not graduate in four years are considered to be 'not successful (0).'

Independent Variables

Demographics

The first group of factors selected for the model control for demographic characteristics possessed by the incoming students included whether a student received a Pell Grant during their first term at the institution. This served as a proxy for socioeconomic status. This dichotomous variable is coded one (1) for receiving a Pell Grant and zero (0) for not receiving a Pell Grant. Underrepresented minority is another characteristic used in the model and the students were given the opportunit to self identify their race as African American, Asian, Hispanic, Native American, white, or refuse to respond. In order to create a dichotomous variable, African-American, Asian, Hispanic, and Native-American students were assigned a one (1) while white students were assigned a zero (0). Students who refused to provide this information were excluded from the model. Male is a dichotomous variable in which men were assigned a one (1) and women were assigned a zero (0).

Engagement

The Catholic variable addresses the religious nature of the focus institution. Students who self-reported their religious affiliation as Roman Catholic were assigned a one (1) while all other students were assigned a zero (0). The focus institution pays attention to this measure as the mission of the institution is to be inclusive and accepting of all religious views held by faculty, staff and students. The On-Campus Residence is a dichotomous variable in which students living on campus during their freshman year are assigned a one (1) and those who did not were assigned a (0). Percent PT Faculty is a measure designed to capture the percentage of adjunct-taught credits a freshman student is exposed to during their first semester at the institution. Each student was assigned a value expressing the percentage of courses taught by adjuncts. For example, a student enrolled in four courses with two of the courses taught by adjuncts would be assigned a value of 50 percent (2/4). J-Term is a variable that indicates whether a student enrolled in a time intensive course at the institution between their first fall semester and the following spring. Students enrolling in a J-Term course were assigned a one (1) and those who did not enroll were assigned a zero (0).

Pre-Enrollment Academics

Three factors associated with previous academic behaviors were included. Students have the opportunity to provide the type of high school they attended prior to enrolling at the focus institution (public, Catholic, private non-Catholic, and homeschool). Public, Catholic, and private non-Catholic were aggregated in order to develop a dichotomous variable (homeschool) in which homeschool students were assigned a one (1) and all others assigned a zero (0). The ACT Composite variable for each student is the highest score submitted by the student on the ACT exam, the most common exam submitted by students during the admission process. Transfer Credit is a variable which includes all college level credit earned and transferred to the focus institution prior to enrollment. This variable consists of credit earned through postsecondary institutions, military, Advanced Placement, etc.

First Term Academics

Completed Schedule is a dichotomous variable in which students complete their entire schedule during the fall semester (1). Students who fail or withdraw from at least one credit during the fall semester are considered to have not completed their schedule (0). Part-Time Status is a dichotomous variable in which students

enrolled in 13 or more credits were assigned a one (1) while students enrolled in 12 or fewer were assigned a zero (0). The value for full-time students was set at 13 for two reasons. First, 11 freshman students entering the institution between 2004 and 2008 enrolled in fewer than 12 credits. Second, prior research at the institution has revealed that students enrolled in 12 or fewer credits maintain significantly lower GPAs and experience lower retention rates than those who enroll in 13 or more. As such, the part-time status variable was restructured for this research project and does not reflect the course load policies of the focus institution.

Analysis

Two separate approaches were used to identify the relationship between high school type and academic outcomes. First, a series of bivariate tests (ANOVA and Chi-Square) were employed to identify one-to-one relationships. Next, a series of multivariate analysis techniques were used to consider multiple explanatory variables (GPAs, retention and graduation rates). Due to the presence of two dependent variable types (quantitative and categorical), two different statistical tests were employed. These tests were multiple regression analysis (GPAs) and binary logistic regression analysis (fall-to-fall retention and four-year graduation rates). In both cases, the statistical tests enable the researcher to estimate the values of a dependent variable from known outcomes of a group of independent variables. Further, each test provides the researcher with a coefficient and standard error for each of the independent variables. Positive coefficients indicate the factor exerts a positive influence on the dependent variables while negative coefficients exert a negative influence.

Results

As mentioned earlier, a series of bivariate analyses were conducted to better understand the relationships between high school type and selected measures. Table 1 provides a breakdown of the different groups with p-values set at .01 (***), .05 (**), and .10 (*).

Table 1. Selected Factors by High School Type[1]

	Public	Catholic	Private	Home	p	x
Demographics						
Male	48.3%	55.8%	56.4%	71.1%	***	50.3%
Received Pell	14.8%	9.8%	8.8%	34.2%	***	13.8%
Underrepresented Minority	12.2%	10.4%	10.8%	6.8%	*	11.8%
Engagement						
Catholic	47.0%	86.9%	48.9%	68.4%	***	54.9%
Live on Campus	92.9%	94.2%	86.6%	72.4%	***	92.7%
Percent PT Faculty	47.8%	46.7%	47.5%	46.7%		47.5%
Enrolled in J-term	17.3%	18.4%	20.6%	14.3%		17.6%
Pre-College Academics						
ACT Composite	25.0	25.1	25.6	26.5	***	25.0
Transfer Credits	6.6	3.6	2.9	14.7	***	6.0
HS GPA	3.56	3.49	3.43	3.74	***	3.54
Transfer GPA	3.43	3.46	3.42	3.65	***	3.44
First Fall Academics						
Completed Schedule	87.7%	88.9%	85.6%	91.4%		87.9%
Part-Time Status (<13)	7.8%	6.9%	10.7%	9.2%		7.8%
Fall GPA	3.07	3.09	3.11	3.37	***	3.08
Persistence						
Fall-to-Spring Retention	96.3%	95.8%	96.5%	94.3%		96.2%
Fall-to-Fall Retention	87.5%	87.6%	89.5%	88.6%		87.6%
One-Year Cumulative GPA	3.12	3.12	3.13	3.41	***	3.12
Four-Year Cumulative GPA	3.16	3.13	3.18	3.46	*	3.16
Four-Year Graduation	58.6%	54.2%	51.5%	66.7%		57.5%

[1] p-values: .01 (***), .05 (**), and .10 (*)

Summary of Bivariate Analysis

Demographics

Homeschooled students (71.1 percent) were more likely to be male when compared to the overall population of undergraduate students (50.3 percent). Additionally, homeschooled students (34.2 percent) were 2.5 times more likely to receive a Pell Grant when compared to the entire group (13.8 percent). Homeschooled students (6.8 percent) were less likely to self-identify as a person of color compared to the overall population (11.8 percent).

Engagement

When considering engagement factors, students reporting a high school type of homeschool were more likely to self-identify as Roman Catholic (68.4 percent) compared to the overall population (54.9 percent). Further, homeschooled students (72.4 percent) were less likely to live on campus when compared to the entire freshman cohort (92.7 percent).

Pre-College Academics

Homeschooled students (26.5) reported a significantly higher ACT-Composite score when compared to the overall cohort (25.0). In addition, homeschooled students (14.7) earned more college credit prior to their freshman year when compared to the overall population (6.0). Homeschooled students reported significantly higher high school GPAs (3.74) and transfer GPAs (3.65) when compared to the overall group (3.54 and 3.44 respectively).

First Fall Academics

Homeschooled students (3.37) earned a significantly higher fall semester GPA when compared to the overall cohort (3.08).

Persistence Measures

Homeschooled students (3.41) earned a higher first-year GPA when compared to the overall group (3.12). Additionally, homeschooled students (3.46) earned a significantly higher fourth-year GPA when compared to the freshman cohort (3.16).

Multivariate Analysis

First and Fourth Year GPAs

As stated earlier, an additional approach to understanding academic outcomes of homeschooled students is to conduct multivariate analysis in order to control for additional factors. More specifically, students were identified based on their enrollment in a homeschool. The dichotomous variable (yes/no) was then entered into two regression models with the variables listed in Table 2. When considering GPAs, the homeschool variable had a positive impact on first-year GPA when considering all of the factors. This positive impact continued to the fourth year (Table 2).

Fall-to-Fall Retention and Four-Year Graduation Rates

The homeschool variable did not significantly contribute to the fall-to-fall retention or four-year graduation models (Table 3). In other words, the homeschool variable had neither a positive nor a negative impact on these academic outcomes. However, homeschool students did achieve a higher retention rate (88.6 percent) compared to the overall population (87.6 percent). Further, homeschool students achieved a higher graduation rate (66.7 percent) when compared to the overall population (57.5 percent).

Conclusion

The growth in homeschooling has been phenomenal with the population of this group nearly doubling in the past eight years. Despite this, little is known about this group once they enter the higher education arena. This exploratory study examines the academic outcomes of homeschooled students who enter a medium-size doctoral institution located in the Midwest. Descriptive analysis reveals homeschool students possess higher ACT scores, GPAs and graduation rates when compared to traditionally-educated students. In addition, multiple regression analysis results reveal that students, at this particular institution, who are homeschooled, earn higher first-year and fourth-year GPAs when controlling for demographic, pre-college, engagement, and first-term academic factors. Further, binary logistic regression results indicate there is no significant difference between homeschooled student's fall-to-fall retention and four-year graduation rates when compared to traditionally-educated students while controlling for these same factors. Still, the results should be carefully considered in regards to this particular institution as the study took place at one institution with a small sample size (N=76). Nonetheless, this study shows that this group of students outperforms their traditionally-educated peers when considering the GPA measures. Perhaps more importantly, this group of students performed at the same level as their peers when considering fall-to-fall retention and four-year graduation rates. As this group continues to grow, it is imperative that institutional researchers lead the way in developing a strong understanding of academic outcomes of homeschool students. As such, further research should be conducted on a wider scale to better understand the academic outcomes of this group. For example, state offices of higher education located in Minnesota and Florida require in-state institutions to provide student level data on an annual basis. These datasets would provide an ideal opportunity to further explore the GPAs, retention rates and graduation rates of homeschooled students. Although the population observed in this study should not be considered generalizable to all undergraduates at all schools, the results do provide college admission counselors with further evidence that homeschooled students are prepared for college and may even be considered as high achievers when compared to non-homeschooled students.

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Table 2. Multiple Regression Coefficients for First-Year and Fourth Year Cumulative GPA[2]

	First-Year GPA			Four-Year GPA		
	B	Std Error	p	B	Std Error	p
Demographics						
Male	-.161	.015	***	-.204	.026	*
Received Pell	-.028	.023		-.038	.038	
Underrepresented Minority	-.061	.025	**	-.085	.040	**
Engagement						
Catholic	.042	.015	***	.029	.026	
Live on Campus	.090	.031	***	.027	.004	
Percent PT Faculty	.001	.000	***	.000	.001	
Enrolled in J-term	.069	.020	***	.036	.032	
Pre-College Academics						
ACT Composite	.053	.003	***	.056	.004	***
Transfer Credits	.005	.001	***	.005	.002	***
Home School	.188	.081	**	.218	.133	*
First Fall Academics						
Completed Schedule	.899	.023	***	.922	.036	***
Part-Time Status (<13)	.211	.031	***	.220	.048	***
Constant	.605	.077	***	.611	.122	***

[2] p-values: .01 (***), .05 (**), and .10 (*)

Table 3. Logistic Regression Coefficients for Fall-to-Fall Retention and Four-Year Graduation[3]

	First-Year GPA			Four-Year GPA		
	B	Std Error	p	B	Std Error	p
Demographics						
Male	.294	.087	***	-.272	.151	*
Received Pell	-.096	.130		-.069	.209	
Underrepresented Minority	-.341	.143	***	-.024	.221	
Engagement						
Catholic	.162	.086	*	.237	.149	
Live on Campus	.521	.145	***	.563	.231	**
Percent PT Faculty	-.004	.002	**	-.006	.004	
Enrolled in J-term	.948	.147	***	1.038	.261	***
Pre-College Academics						
ACT Composite	-.005	.015		-.015	.025	
Transfer Credits	.022	.006	***	-.028	.011	**
Home School	.137	.498		.164	.695	
Fall Academics						
Completed Schedule	1.501	.099	***	1.719	.157	***
Part-Time Status (<13)	.494	.151	***	.512	.245	**
Constant	3.259	.662	***	3.466	1.019	***

[3] p-values: .01 (***), .05 (**), and .10 (*)

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