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Ready or Not: The Effectiveness of Homeschoolers' Academic and Social Preparation

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Abstracts: This study examined the effectiveness of homeschoolers' college preparation. Approximately 250 formerly homeschooled high school students who had attended or were attending college completed a self-report survey that asked about their academic achievement, social preparation, sources of financial aid, and intended majors. Participants had been homeschooled for at least three years of high school. Questions covered both objective and subjective measures of success. The findings reveal that homeschooled students are above average in academic preparation, receive scholarships regularly, and integrate well socially into college. This information is useful for homeschool parents and for educators helping homeschooled students integrate into college.

Key words: homeschooling, college, high school, academic, social, scholarships, scores, adjustment

1. Introduction

As more and more families turn to homeschooling, the number of homeschool alumni is increasing exponentially. In 2015, there were an estimated 1.8 million homeschooled students in the United States, compared to 1.5 million in 2008 (National Center for Education Statistics, 2013); the exact number cannot be calculated because of the various ways of classifying homeschooling. According to the Coalition for Responsible Home Education (Homeschool notification & Homeschool options) (CRHE), an educational advocacy group that promotes policy reform in homeschooling, there are several ways that parents can legally educate their children at home; these policies vary by state. Parents can choose to register with the local school board as a home school. In some states, parents can also register as extensions of private schools. In other states, students can take online public school, correspondence, or cyber charter school classes. Some schools offer an umbrella school service; these schools technically are the school the student attends, and parents report grades, curriculum, and standardized test scores to that umbrella school. Students homeschooled under the last three of these options would technically be considered private school students, not home school students. Given the variety of classifications of homeschools, it is difficult to obtain an accurate number of homeschooled students (Homeschool options).

Because homeschooling is still relatively new — it was not legal in all 50 states until 1993 — (Somerville Scott W., 2001) there is little research on formerly homeschooled students. As homeschooling grows, it is

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beneficial to examine the experiences of formerly homeschooled students to better prepare current generations. Most research to date focuses on younger students or includes higher participation in younger grades, potentially because homeschooling seems to be more popular in younger grades (Delahooke M. ,1986; Martin-Chang S., Gould O. N. & Meuse R. E., 2011; Ray B. D., 2010). The purpose of this study is to look for similarities and differences between homeschooled and traditionally-schooled students in terms of college preparation, both social and academic. This information is important to home educators who are preparing students for college as well as to colleges who have increasing numbers of formerly homeschooled students in their incoming classes.

When researching homeschooling, however, it is important to keep in mind several key points. Due to the lack of regulation (only 29 states require an annual notice for self-reported homeschoolers, 10 more states require a one-time notice when beginning to home school, and the remaining 11 states do not require any notification at all) (Homeschool notification). and differences in classification of homeschooling (Homeschool options), it is nearly impossible to get a truly representative or random sample of homeschoolers. Therefore, all conclusions drawn from research about homeschoolers must take into account important background factors such as income, family size, and parental education level. This limitation affects both the research highlighted in this review and the current study; however, careful consideration of these background factors allows researchers to paint a more accurate picture of the subsection of homeschoolers under examination.

1.1 Demographics

Most studies examining the effectiveness of homeschooling compare the selected sample of homeschoolers to national averages for traditionally (both public and private/religious) schooled students. However, these comparisons fail to sufficiently take into account demographic information. Three of the most cited studies on homeschoolers' achievement find that homeschoolers academically outperform traditionally schooled students (Ray B. D., 2010; Ray B. D., 2004; Rudner L. M., 1999). However, one finds that participants in these surveys tend to be overwhelmingly white, high SES, often religious, and from two parent households where one parent usually stays at home and both have higher levels of education than the national average. It is logical that these factors would heavily influence student academic achievement, as data points to the notion that these family characteristics positively impact student academic performance (Khan R. M., Iqbal N. & Tasneem S., 2015; Morgan P. L., Farkas G., Hillemeier M. M. & Maczuga S., 2009; Seong Park H. & Bonner P., 2008). If studies of homeschooled students were instead compared against traditionally-schooled students with similar characteristics (e.g., white, high SES, 2-parent household), the findings might not be as dramatic (Welner K. M. & Welner K. G., 1999). Barwegen compared the academic achievement of traditional students with high levels of parental involvement and those with low levels of parental involvement at the same high school; significant differences were found between the two groups (Kunzman R. & Gaither M., 2013). The outcomes of students in Rudner's and Ray's studies (Ray, B. D., 2010; Ray B. D., 2004; Rudner L. M., 1999) tend to mirror the outcomes of studies of traditionally-schooled students whose parents are deeply involved in their education. This is not to say that all homeschooling parents are involved; homeschooling spans a wide range of experience and background. Instead, this is a cautionary note to ensure that background factors are corrected for before making comparisons between homeschooling and traditional schooling. Studies that corrected for background factors found, in general, much more modest differences between the scores of traditionally schooled and homeschooled students.

1.2 Post-Secondary Attendance and Opportunities

Attendance rate is difficult to determine for homeschoolers given the widely disparate methods of reporting

homeschooling. The Cardus Education Survey provided weighted responses based on demographic variables, unlike most other surveys (Pennings R., 2011). It surveyed a random sample of former traditionally-schooled students and homeschooled students who had grown up in religious homes and asked those adults a series of questions related to their school experiences, quality of life, and pursuit of higher education (Belfield C. R., 2005). Based on comparisons with the traditionally-schooled students in the study, homeschoolers were less likely to attend institutions of higher education. Belfield found that the percentage of students took the SAT as "homeschoolers" should have been larger based on the reported percentage of homeschoolers in the United States (Belfield C. R., 2005). This parallels the low rate of homeschoolers taking the ACT, based on 2011 ACT data (Blondin T., 2016, September 23). Since the overwhelming majority of post-secondary institutions require SAT or ACT scores, it is concerning that homeschoolers are taking these tests at such low rates. Given these results and the fact that homeschool students are generally underreported in the United States, it is logical to conclude that homeschoolers are attending college at lower rates than their peers. However, once again, capturing accurate numbers is extremely difficult since there is no clear way to track homeschooled students.

Once they enter college, Cogen's findings show that homeschoolers have a slightly higher retention and graduation rate when compared to the overall student population (Cogen M. F., 2010). However, Jones did not find a significant difference in the retention rates of homeschooled and traditionally schooled college students.[20] These mixed findings lead to no solid conclusions regarding differences in collegiate retention among homeschooled and traditional students.

Another area that has not been thoroughly examined is the amount of college scholarships that homeschoolers are awarded. To date, there are no studies that ask this question. Given the rising costs of college, tuition is often a prohibitive aspect for any student, including those who are homeschooled. Because home schooled students do not have access to a college counselor, they may have a harder time finding scholarships and financial aid. Nationally, the average spending on college in 2014 was $20,882 (Clark K., 2015). The average amount of aid students received was $8,025 (Clark K., 2015); this includes merit and need-based scholarships in addition to federal aid. Thus, in 2014, approximately 28% of college expenses were covered by some type of assistance, whether scholarship or aid. This approximation fails to take into account the type of school; numbers for scholarships are not available by institution type (Clark K., 2015). While private institutions are traditionally more expensive than state schools, many offer greater scholarship or assistance opportunities. For example, 223 private American colleges now offer every freshman a scholarship (Phillips L., 2010). To date, there is no data on how much financial aid homeschool students receive for college.

Additionally, there is little research on the majors homeschooled students choose to pursue once they enroll in college. Phillips concluded that homeschoolers are less likely to major in the natural sciences than traditionally schooled students but did not make any conclusions about which kinds of majors they generally choose.[23] In addition, a study at Austin College found that homeschoolers tended to major in math and science less frequently than their traditionally schooled peers (Wheaton J., 2010). Homeschoolers also had a lower, though not statistically significant, GPA in those science and math courses (Bagwell J. N. Jr., 2010).

On the other hand, a study at York Technical College in South Carolina noted statistically significant differences between the COMPASS scores of homeschooled and traditionally schooled students, favoring formerly homeschooled students (Bagwell J. N. Jr., 2010). The COMPASS assessment is a set of assessments that allows higher education institutions to assess student readiness for college-level courses. Bagwell's findings highlighted differences in every assessed content area except algebra and college algebra. Homeschoolers earned

higher scores than their traditionally schooled peers in these two content areas, but the differences were not statistically significant. In addition, homeschoolers also earned statistically higher overall GPAs and GPAs in math courses than their traditionally schooled peers (Bagwell J. N. Jr., 2010). Interestingly, in interviews, homeschooled students expressed more doubt about their abilities in math than did traditionally schooled students, despite maintaining higher, above-average grades in these areas.

Based on data from standardized test scores for homeschooled elementary and secondary students (Rudner L. M., 1999; Frost E. A. & Morris R. C., 1988; Ray B. D., 1997), homeschoolers' SAT scores (Blondin T., 2016; Mexcur D., 1993), and research concerning formerly homeschooled college students (Quaqish B., 2007), it appears that homeschooled students are comparatively stronger in humanities-based subjects than in math or natural sciences. The difference may be due to the confidence level of parents in teaching math and science; or, the greater strength in humanities may be due to homeschooling families' greater focus on reading (Kunzman R., 2009; Thomas A. & Pattison H., 2008).

1.3 Socialization

Traditionally, homeschooled students have been stereotyped as lacking socialization, based on the assumption that homeschooling deprives children of group interaction and exposure to social norms (Barwegen L. M., Falciani N. K., Putnam S. J., Reamer M. B. & Stair E. E., 2004). Holder (2001) found that homeschooled students were adequately prepared socially, with social preparation defined as "the battery of 'people skills' that allow people to cooperate in groups, form rewarding interpersonal relationships, and communicate effectively with each other." One significant finding was that socialization did not happen as naturally; parental commitment at the beginning was necessary to support successful socialization among homeschooled students. Delahooke found no significant differences between the social skills of private and homeschooled students; they did find, however, that homeschooled students were less peer-oriented and more family-oriented than students attending private schools (Delahooke M., 1986).

Beyond the early, developmental years, there are expected social skills among students as they transition from secondary school. Bolle, Wessel, and Mulvihill (Bolle M. B., Wessel R. D. & Mulvihill T. M., 2007) conducted a series of interviews with formerly homeschooled college students and discussed their various experiences of transition and social integration. The formerly-homeschooled students experienced many of the transition challenges that traditionally-schooled students faced, and they were able to overcome them and be socially successful in college. Saunders (Saunders M. K., 2009) conducted a study at Wheaton College and also found that homeschooled students were adequately prepared for the social transition. Barno (Barno R., 2003). reported that homeschoolers reported adequate preparation and easy adjustment to college from a homeschool setting. Sutton (Sutton J. P. & Galloway R. S., 2000) reported that for the most part, formerly-homeschooled college students were indistinguishable from private or public schooled peers in terms of their social skills, but had stronger leadership skills. Ray states that adults who were homeschooled tend to be more civically engaged, though he did not control for income, education, or other demographics (Ray B. D., 2004). On the other hand, the Cardus Education Survey (Pennings R., 2011) found that homeschool graduates were significantly more likely to report "lack of clarity of goals and sense of direction" and "feelings of helplessness in dealing with life's problems" than traditionally schooled graduates. While the Cardus survey contained only students who grew up in religious homes, it is one of the only studies of homeschoolers with a randomly-selected sample. Thus, its findings are important to consider. Ultimately, homeschooled students appear to be adequately prepared to socially integrate

into institutions of higher learning.

1.4 Academic Achievement

There is a prevailing belief today that homeschoolers outperform their traditionally-schooled counterparts in academics. Of particular interest to this study is their achievement in high school. However, two of the most widely-cited studies on homeschoolers' academic achievement had a lower sample size in older grades than would be expected based on US Census numbers for that age group in the nation at large (Ray B. D., 2010; Rudner L. M., 1999; Ray B. D. & Wartes J., 1991). Rudner (1999) found that his sample of homeschooled students consistently performed well above national norms for traditionally schooled students (both in public schools and in private schools) when it came to every subject area and every grade level. However, Rudner himself states that his study is not a comparison between homeschool students and any other students — that it is simply a statement that homeschooling can produce desirable academic outcomes. When examining the demographics of Rudner's sample, it is important to note that they mirror the characteristics previously discussed: primarily white, wealthier than average, single-income families with parents who are married and often both have college degrees. A similar situation plays out in the research by Ray (2010), who found well-above average achievement for homeschoolers but failed to adequately account for demographics. McCracken (2010) summarizes her critique of Ray's study with the following sentence: "The top-scoring 2-3% of homeschooled elementary- and middle-school age children from wealthy white Christian married couples who volunteer them for standardized tests score approximately 36 percentage points higher than the national average of all children in public schools."

Several studies have noted above average academic achievement in the areas of English and language for homeschooled students but average or below average achievement in math. Frost and Morris (1988) found that when controlling for background factors, homeschooled students scored above average in every subject except math. In a study of homeschoolers in Washington State, Ray (1991) found that homeschoolers' scores were above average reading and vocabulary and slightly below average in math computation. Coleman (2014) analyzed data from Alaska and Arkansas, the two states that require annual testing of homeschoolers and a public release of those scores. She found that while homeschoolers in Arkansas score above average on reading tests (between the 55th and 67th percentile for grade 10 reading between 1997 and 2004), they score several percentage points lower in math tests (between the 53rd and 42nd percentile for grade 10 math between 1997 and 2004). This is the opposite of publicly-schooled students, who tend to perform slightly higher on math tests and slightly lower on reading tests. Alaska's homeschool data shows the same trends. Homeschoolers are about 6% above the public school average in reading scores, but about 6% lower than the public school average in math scores.

A more useful measure of academic achievement for high school students includes standardized pre-collegiate test scores, since almost all college-bound students must take them. All studies that looked at composite ACT scores reported that homeschooled students did at least as well as their traditionally schooled counterparts, with homeschoolers' scores being slightly higher but not usually statistically significant (Cogen M. F., 2010; Holder M. A., 2001; Snyder M., 2013; Galloway R. A. & Sutton J. P., 1995; Sutton J. P. & De Oliveira P., 1995). Once again, these comparisons often fail to adjust for the differences in family income and other factors. Homeschoolers do not tend to take the ACT at the same rate as traditionally schooled students; according to Belfield (2005), less than a third of the expected number of homeschooled students are taking the SAT based on the percentage of traditionally schooled students taking it and the current number of homeschoolers. In addition, Belfield[17] found that homeschoolers performed slightly lower than traditionally schooled students on the math

portion of the SAT when correcting for background factors. Quaish (2007) found that homeschoolers' scores were slightly lower on the ACT mathematics test. Mexcur (1993) also found that while there was no significant difference between SAT scores for homeschooled and traditionally schooled students in the composite, English, Reading, or Science Reasoning scores, homeschoolers' scores were significantly lower on the ACT Mathematics subtest. It is possible that only more motivated and academically gifted homeschool students are taking standardized tests, leading to a slightly biased analysis.

Several studies also looked at first-year college GPA of students. Cogen (2010) found that homeschooled students had significantly higher GPAs and higher ACT scores than non-homeschooled students; however, they caution that their results must be considered carefully as the sample size was small and all from one Midwestern doctoral institution. Snyder (2013) found a significant difference between the ACT or SAT scores and overall GPA of homeschool and traditionally-schooled students with homeschoolers outperforming traditionally-schooled students. On the other hand, Galloway and Sutton found no significant difference among students' scores in English aptitude tests based on schooling type (Sutton J. P. & De Oliveira P., 1995), and Sutton and de Oliviera (Barwegen L. M., Falciani N. K., Putnam S. J., Reamer M. B. & Stair E. E., 2004) found no statistically significant difference in the critical thinking skills (based on the California Critical Thinking Skills Test) among students from different schooling backgrounds. Sutton (2000) found no significant difference in grades, GPA, academic honors, or rank among college students from different schooling backgrounds. Jones and Gloekner (2004) found that there was no significant difference between homeschooled and traditionally schooled students in first year GPA, first year credit hours earned, or ACT composite or sub-test scores. Mexcur (1993) found no significant differences in GPA for all subjects except English; homeschooled students had a slightly higher English GPA than did traditionally schooled students. Barno (2003) found that homeschooled students had marginally higher but not statistically significant GPA than traditionally schooled students. In sum, homeschooled students' academic achievement was equivalent to or slightly elevated when compared to that of their traditionally-schooled peers, based on their GPA and standardized test scores.

Based on findings to date, several research questions guide this study.

- How does the ACT or SAT scores of formerly homeschooled college students compare to the national average, and are those comparisons valid in terms of comparing similar parental education, and family income?
- How many dual enrollment or Advanced Placement classes are homeschoolers taking before college, as another standardized measure of preparation?
- Do former homeschoolers access financial aid at similar rates to other college students?
- How do formerly homeschooled students perceive their social integration to college?
- How do formerly homeschooled students perceive their adjustment to the academic demands of college, and how do more objective measures support that perception?
- Is there a pattern in formerly homeschooled students' choice of majors; do they tend towards one discipline more than others?

2. Methods and Procedures

2.1 Survey Construction

This study used a mixed methods research design to collect information from formerly-homeschooled

college students about their academic and social preparation for college. The study employed a web-based survey through REDcap and contained 50 questions asking about participants' high school and college experiences and achievement. These questions covered both objective measures, such as GPA and standardized test scores, as well as self-reflection questions on academic and social adjustment. Responses were collected for one month. This project received approval from the IRB at the participating institution of higher learning, and all researchers completed human subjects training on research involving human subjects.

The goal of this study was to better understand participants' preparation for and success in high school and college, and contained binary, single response, multiple response, Likert, and open-ended questions. Because respondents answered both fixed-response and open-ended questions, researchers were able to collect a variety of objective (test scores, GPA, etc.) and subjective (e.g., perceived social and academic adjustment) information.

2.2 Participants

The survey used a convenience sample; it was distributed through a university student email list, through the social media sites of Homeschoolers Anonymous Reaching Out (HARO) and CRHE, and word of mouth. Participants were at least 18 years of age, currently or previously enrolled in a 2- or 4-year institution, and had been homeschooled for at least three years during high school. The survey was developed in collaboration with CRHE, which provided consultation based on their previous surveys of this population.

In order to maintain the anonymity of participants, this survey did not collect extensive demographic information. All participants had to be at least 18 years of age, have been homeschooled for at least three years in high school, and have been previously or currently enrolled at a 2- or 4-year institution of higher education. The demographics section asked about age, gender, family income, family size, parental academic achievement, and race.

2.3 Data Collection & Analysis

The survey was hosted on REDcap, an online research survey site, which also protected the information. The survey was available for one month, from February 16, 2016 to March 18, 2016. At the end of this period, there were 252 complete (participant had answered all questions and had not previously completed the survey) responses.

The survey consisted of six sections: demographics, academic achievement in high school and college, social adjustment to college, scholarships and financial aid, and choice of major. To protect privacy, all information was collected anonymously. If desired, participants could elect to be notified of the survey's results.

The next section of the survey asked about academic achievement in high school. Sample questions included "What was your high school GPA (on a four-point scale)?" with four range responses: "4.0, 3.0-3.9, 2.0-2.9, or below 2". Respondents were also asked about standardized test scores (ACT or SAT) and number of Advanced Placement or dual enrollment classes taken during high school.

Following, the section on college academic achievement asked similar questions about GPA and Honors coursework. It also contained multiple-response questions asking participants what kinds of colleges they attended and what kinds of colleges they considered. The survey then contained several Likert questions where students were asked to rate their perceived success at certain measures of academic adjustment such as developing effective study habits, meeting deadlines, understanding academic expectations, and asking questions of professors.

Social adjustment followed academic adjustment. Participants were asked if they were commuter or

residential students, and Likert questions asked about their ability to adjust to college socially and build community. Other questions asked about involvement in clubs and campus organizations and use of on-campus counseling services.

In the scholarships section, respondents were asked if they had submitted a FAFSA and what kinds of aid they received for college. Then, they were asked what percentage of tuition and what percentage of other college related costs were covered by federal or institutional scholarships. Finally, they were asked about their chosen collegiate major.

This survey was submitted to the university's Institutional Review Board (IRB) for approval before being released. In addition to approval from Lipscomb's IRB, the researchers obtained permission from both CRHE and HARO before they distributed the survey.

The survey itself contained a digital consent form and a specific question asking if participants were at least 18 years of age. If either of these were answered in the negative, the survey automatically terminated, and the respondent could not continue. The consent form contained in the survey listed the risks pertaining to the survey; these, however, were minimal.

3. Results

In terms of age, about half of the respondents were between the ages of 18-24 (n = 135, 48%); another 44% were between the ages of 25-34 (n = 122). Respondents skewed female (n = 205, 74%), with 23% identifying as male (n = 63) and 3% (n = 9) identifying as "other".

Respondents found out about the survey from various sources. Sixty-three percent (n = 178) found the survey on Homeschoolers' Anonymous or HARO. Eighteen percent (n = 51) found out from friends sharing the survey on social media. Fourteen percent (n = 40) found out about the survey from a broadcast email sent to local university students.

Family demographics were also interesting. Eleven percent of respondents did not know their family income; over 80% had a family income over $20,000. The largest category was $50,000-75,000, with 28% (n = 77) of respondents. Family size was larger than average, with 4.5 children per family on average. Survey respondents were overwhelmingly white (91%, n = 251).

Only 60% of respondents said that their primary homeschooling parent had a bachelor's degree or higher (43%, n = 118, bachelor's; 17%, n = 45, master's or doctoral). Twenty percent said that their primary homeschooling parent had no college at all. The secondary homeschooling parent also had at least a bachelor's degree 60% of the time, though the percentage of master's degrees was higher (30%, n = 82, bachelor's; 30% n = 82, master's or doctoral).

Parental education level seemed to impact students' high school academic performance (see Table 1). Of students whose primary homeschooling parent had a doctoral degree, 100% (n = 3) had a GPA of 3.0-4.0. This is compared to the percentage of students with a GPA of 3.0-4.0 whose parents had a Master's degree (94%, n = 32), a Bachelor's degree (95%, n = 102), some college education (37%, n = 18), technical or vocational education (60%, n = 6), and a high school diploma or GED (73%, n = 29).

Table 1 GPA of Student by Education of Primary Homeschooling Parent

Highest academic achievement of primary home-schooling parent	Doctoral Degree		MA or MS		BA or BS		Some college		Technical or vocational school		High school diploma or GED	
N Total	4		34		107		48		10		40	
not complete												
	N	**%**	**N**	**%**	**N**	**%**	**N**	**%**	**N**	**%**	**N**	**%**
GPA 4	3	75	15	44	44	41	16	33	1	10	8	20
GPA 3-3.9	1	25	17	50	58	54	2	4	5	50	21	53
GPA 3-4	*4*	*100*	*32*	*94*	*102*	*95*	*18*	*37*	*6*	*60*	*29*	*73*
GPA 2-2.9	0	0	1		1		25		2		5	
GPA below 2	0	0	0	0	0	0	1		2		2	
No GPA	0	0	1		2		4		0		4	

3.1 High School Academic Achievement

Homeschooled students tended to have a high GPA, with 87% (n = 235) of respondents reporting a 3.0 or higher GPA. The average GPA of high school graduates, according to the latest data from the National Center for Education Statistics, was 3.00 (America's High School Graduates). Additionally, 5%, n = 13, of respondents did not have a high school GPA. In addition, 7 survey respondents ended the survey at the GPA question. The "did not have a GPA" option was added after the survey began, based on feedback from respondents who said that they did not have a GPA.

Findings concerning AP courses and dual enrollment included that 80% (n = 215) of respondents did not take any Advanced Placement (AP) courses for credit. Eight percent (n = 21) took one course; 9% (n = 25) took 2-4 courses; and 3% (n = 9) took 5 or more courses. The number of dual enrollment courses was similarly low. Sixty-three (n = 171) percent of respondents took no dual enrollment courses. Seven percent of respondents (n = 18) took one course; 17% (n = 46) took 2-4 courses; 13% (n = 35) took five or more courses.

3.2 ACT/SAT Scores

A similar number of respondents reported taking the ACT versus the SAT. The SAT was slightly more popular, with 55% (n = 131) of respondents taking it. Twelve percent (n = 32) reported a score between 2200-2400. The next range, 1800-2199, described 26% (n = 70) of the respondents. Eight percent (n = 22) reported a score between 1400-1799; the same number reported a score between 1000-1399. SAT scores may have been slightly inaccurate, as at first the survey did not note that respondents needed to convert their scores to the new SAT grading scale (introduced in 2005). The survey was edited to add this note, but it is unknown if all respondents who took the SAT before 2005 looked at the score ranges and knew to convert their score.

Fifty-one percent (n = 119) of respondents took the ACT. Twenty percent (n = 53) reported a score of 30 or higher. Twenty-three percent (n = 62) reported a score between 25-29. Seven percent (n = 20) reported a score between 20-24. Seventeen percent (n = 43) of respondents did not take either standardized test.

There was also a trend between parental education level and ACT scores, as seen in the Table 2 below. In families where the primary homeschooling parent had at least a bachelor's degree, students' scores were overwhelmingly 25 or over on the ACT. However, the limitation of this subgroup of data is that about half of participants did not take the ACT, so the sample sizes were very small.

Table 2 ACT Score of Student by Education of Primary Homeschooling Parent

Highest academic achievement of primary homeschooling parent	Doctoral degree		MA or MS		BA or BS		Some college		Technical or vocational school		High School diploma or GED	
N total	4		20		59		20		4		1	
	N	%	N	%	N	%	N	%	N	%	N	%
30+			6	30	31	53	8	40				
25-29	2	50	8	40	26	44	7	35	4	100	1	100
20-24	2	50	5	25	2	3	5	25				
15-19												
below 15			1	5								
(No ACT)	(0)		(14)		(48)		(28)		(6)		(0)	

3.3 Collegiate Academic Achievement

The majority of respondents (71%, n = 185) attended a university, with 43% (n = 111) attending a community college at some point. The majority (88%, n = 231) pursued a bachelor's degree, with 28% (n = 73) pursuing an associate's degree. Respondents were fairly evenly divided between public and private institutions (52%, n = 136; 53%, n = 139, respectively), with some having attended both. Among the 53% of respondents who attended private schools, 10% (n = 25) attended secular schools, while 43% (n = 114) attended religious schools.

Formerly homeschooled college students reported a high GPA in college as well. Ninety-one percent (n = 238) reported a GPA of 3.0 or higher. Seventy-seven percent (n = 203) reported a GPA of 3.5 or higher. In addition, half of the respondents who had access to an Honors program at their institution, about half (39%, n = 103) had been in the honors college (out of 81%, n = 213, who had an Honors program available).

Respondents self-reported that they adjusted well to the academic demands of college. On the measures, "I have adjusted well to the academic demands of college", "I have effective study habits", "I understand what professors ask of me", "I approach professors when I have questions", and "I meet deadlines for assignments and projects", 70% or more of respondents answered positively. Respondents answered the final measure, "I feel intimidated by professors", in the negative 58% of the time (n = 146; see Table 3).

Table 3 Formerly Homeschooled College Students' Academic Adjustment

	N	Percent (agreement)
Adjusted to academic demands	216	85
Effective study habits	190	74
Understand what professors ask	223	89
Approach profs	175	70
Meet deadlines	229	92
Feel intimidated	146	58

3.4 Socialization

Respondents were evenly split between commuter and residential students (52%, n = 130; 48%, n = 121, respectively). Sixty-six percent (n = 162) were involved in at least one academic campus organization; 63% (n = 158) were involved in at least one social campus organization (see Table 2). Forty-seven percent (n = 117) had held a leadership role in a campus organization, out of 96% who had the opportunity.

In response to the item, "I worry about meeting new people," slightly more than half (53%, n = 135) reported discomfort. Fifty percent (n = 126) saw themselves as part of their campus community. Fifty-nine percent (n = 151) felt that they were able to balance their social and academic lives. Forty-three percent (n = 110) felt isolated from campus life, while 39% (n = 101) did not. Forty-six percent (n = 116) felt comfortable and connected to their campus community. Respondents answered strongly to the question, "I feel homesick or lonely", with 63% (n = 162) disagreeing. Finally, respondents answered most strongly to the question, "I talk to people with diverse backgrounds/backgrounds different than mine", with 75% (n = 193) agreeing (see Table 4).

Table 4 Formerly Homeschooled College Students' Social Adjustment

Item Content	N positive	Percent positive	N negative	Percent negative
Worry about meeting new people	135	53	90	35
See myself as part of community	126	50	81	32
Social life interferes with academic work	55	22	151	59
Feel isolated from campus life	110	43	101	39
Homesick or lonely	43	17	162	63
Comfortable & connected to campus community	116	46	82	32
Talk to people with diverse backgrounds	193	75	37	15

3.5 Financial Aid

Eighty-seven percent of respondents filed a FAFSA. Students used various sources to pay for college. The most frequently used source was merit-based scholarships, with 70% (n = 169) receiving a merit-based scholarship to pay for part of their education. Institutional and federal aid (44%, n = 108 and 49%, n = 121, respectively) were also popular sources. Forty-five percent (n = 110) had parents who helped pay for college expenses. Federal loans were also popular; 43% (n = 106) of respondents received some form of federal loans. Twenty-seven percent (n = 65) received a need-based scholarship. Other forms of financial aid included loans from parents and other family and friends, monetary aid from other family and friends, employer aid, and personal loans. Students learned about financial aid from various sources. Table 5 lists some of the most popular sources. Only about a quarter of respondents used the services of a college counselor.

Table 5 Formerly Homeschooled College Students' Sources of Financial Aid.

Source	N	Percent
College financial aid office	156	63
Parents	130	53
Scholarship websites	114	46
College counselor	60	25

In all, 28% of respondents (n = 69) had 75-100% of their tuition covered by federal or institutional scholarships. Another 16% (n = 39) had 50-75% of their tuition covered by federal or institutional scholarships.

3.6 Collegiate Majors and Further Education

Respondents tended to concentrate in the humanities (35%, n = 87). Another 15% (n = 37) majored in the social sciences. Yet another 13% (n = 31) majored in the natural sciences. Allied health accounted for another 9% (n = 22); communication for 8% (n = 20); education for 8% (n = 20); and business 8% (n = 19). Computer and information technology, engineering, and theology and religion each accounted for a smaller percentage of respondents. Sixty percent of respondents had attended or were attending graduate school at some level.

3.7 Limitations

When this survey was first released, the question asking about SAT scores failed to specify that the score range pertained to the 2006-2016 for the SAT. Pre-2006 scores ranged from 400-1600; 2006-2016 scores ranged from 600-2400. (In March of 2016, the SAT switched back to a 400-1600 scale; this did not affect any scores in this survey.) Because of this confusion, a few of the scores from the early part of the survey may not have been recorded accurately. The question was modified to add "based on new (600–2400) scoring system" as soon as it was brought to the attention of the researchers. Several multiple-choice questions also behaved as single-response questions, but these were fixed shortly after the survey opened as well.

In addition, there were a few demographic questions that would have been helpful: geographical information, participation in tutorials or enrichment classes, or classification of homeschool. It would also have been helpful to get an estimate of the dollar amount of financial aid awarded, though this might have been difficult for participants to estimate.

Because of the mostly white, fairly affluent demographic of this survey, the responses cannot be taken as representative of all homeschoolers. In addition, because homeschoolers can be classified in numerous different ways, it is difficult to compare this data to a national average simply on the basis that most national averages are calculated from self-reported homeschoolers.

4. Discussion

Given the distribution of how respondents found out about the survey and the number of respondents (252), this survey had a rather high number of responses compared to other studies of former homeschoolers. There was also a relatively equal distribution between public and private universities and between secular and religious ones. Respondents were also varied in age, with most respondents between the ages of 18 and 34. Because homeschooling was not legal in all 50 states until 1993, there were, as expected, very few respondents who were older than 34.

Homeschooling families tended to be large, at 4.5 children, on average, per family. Also of note, only 60% of primary homeschooling parents and 60% of secondary homeschooling parents had a bachelor's degree or higher level of post-secondary education. Thirty percent (n = 75) of participants reported that neither parent had a bachelor's degree or higher level of post-secondary education. Participants were overwhelmingly white.

Findings concerning high school achievement showed survey participants earning average to above average scores in multiple measures. Survey participants' GPA was high, with 87% having a GPA of 3.0 or higher (on a four-point scale), which could have been due to the fact that grades can be more subjective when parents assign them. However, college GPA followed the same high trend. Respondents reported low AP or dual enrollment courses in high school. ACT scores were remarkably higher than the national average, 28.4 for the survey compared to 21.0 for the national average. (Averages were computed by multiplying the number of responses in a

score category by the median value of that category.) The average SAT score from the survey was 1870, while the national average is 1500. SAT scores were slightly less reliable than ACT scores as many participants took the SAT before the scoring system changed, and not all participants converted their scores. However, even with that variation, scores were still well above the national average.

Students' ACT scores were moderately affected by parental education level. However, given that only about half of participants took the ACT, these results are less clear. On the whole, a parental education level of at least a bachelor's degree had a positive impact on students' scores. Students' high school GPA was also affected by parental education level, much more significantly. For students whose parents had at least a bachelor's degree, at least 96 percent of students had a GPA between 3.0 and 4.0. Those numbers tapered for students whose parents did not have a bachelor's degree or higher; on average, only 57% of students had a GPA between 3.0 and 4.0.

Most respondents pursued a bachelor's degree. Participants split fairly equally between public and private universities, while the majority who attended private schools went to religious institutions. About half were commuter students, and half were residential. GPA was also extremely high for the majority of respondents; 77% reported a college GPA between 3.5 and 4.0. Ninety-one percent had a GPA of 3.0 or higher.

Participants reported a larger than average participation in honors programs. Eighty percent had access to an honors college, and 39% participated in collegiate honors college programs. Participants reported overwhelmingly positively to questions that asked about their adjustment to the academic demands of college, comprehension of what their professors asked, ability to meet deadlines, and study skills. A smaller majority also felt that they could approach their professors and did not feel intimidated by them. This may be a function of homeschooled students having less opportunity to interact with non-family teachers. However, it did not appear to negatively affect students' success in college. Two-thirds of participants were involved in academic leadership organizations, and about half held a leadership role.

Socially, participants adjusted moderately well. Sixty-three percent were involved in social campus organizations. About half of these held a leadership role. About half of respondents saw themselves as part of their campus community. Participants responded most strongly to "I feel homesick or lonely" (only 17% agreed) and "I regularly talk with people from diverse backgrounds/backgrounds different from mine" (75% agreed). Given that homeschoolers may have less interaction with diverse populations, this finding is important as it illustrates that formerly homeschooled students have the ability to converse with those different from them on a regular basis.

Most participants (87%) filed a FAFSA. Seventy percent received some form of merit-based scholarship, and 46% of participants had at least half of their tuition covered by federal or institutional aid. Over a quarter received enough aid to cover 75% or more of their tuition. Only a quarter used the services of a college counselor, turning instead to scholarship websites, parents, and college financial aid offices to find these opportunities.

About half of the participants majored in the humanities, social sciences, or education. Only 13 percent majored in the natural sciences, and about five percent in mathematics or engineering.

5. Conclusions

Overall, this study concludes that homeschool high school graduates are well prepared for college based on their test scores and ability to integrate socially into a college environment. Despite low participation in dual enrollment or AP courses, their high school achievement followed them into college. There, they excelled academically and were more likely to seek academic organizations and be a member of an honors program.

Although they were slightly apprehensive to approach professors, they balanced homework and academic demands well. Homeschooled students had slightly more of a challenge adjusting socially; but in the end, they integrated well, and their social adjustment did not negatively impact their academic success. Homeschooled students received large amounts of federal aid, with almost half of participants receiving enough aid to cover at least half of their tuition, and a quarter receiving enough to cover at least 75% of their tuition. Some of this certainly came from their high standardized test scores (28 ACT, 1870 SAT). They were resourceful in finding financial aid opportunities; with only a few using a college counselor and most finding opportunities at financial aid offices, through scholarship websites, or through networking. Formerly homeschooled students tended to major in the humanities and social sciences, leaning away from natural sciences and mathematics.

On the whole, formerly homeschooled college students seem well-prepared to take on college, both academically and socially. The researchers hypothesized that the students homeschooled in high school would excel in high school, with above average GPAs and standardized test scores, a hypothesis which played out in the data collected. The students would have earned a high level of scholarships. Another prediction was that students would struggle to adjust socially and, to a lesser degree, academically. The predictions about academic achievement were correct; however, respondents expressed little struggle in adjusting to either the social or academic demands of college. Another surprise was the number of students who did not submit the FAFSA. Institutions of higher education that are interested in recruiting students who have been homeschooled should consider working with local and national homeschooling organizations. A partnership between higher education opportunities and the homeschooling community might allow qualified, potentially interested high school students to learn about collegiate opportunities and support resources, such as federal aid and available scholarships. In addition, such partnerships would allow homeschooled students and their teachers to learn about the breadth of academic programs available and any high school prerequisite courses that would support specific college major programs, especially Math and Science programs where homeschooled students are underrepresented (Jones P. & Gloeckner G., 2004).

In the future, there are several trends identified in the survey that could be further pursued. About 13% of respondents did not fill out a FAFSA; anecdotal evidence would indicate that this is either because of lack of parental cooperation in signing it or because financial aid offers did not require it. It would be helpful to understand why more students did not fill out a FAFSA. Financial aid is an area that has not been studied among homeschooled college students and needs to be more closely examined. The sheer number of students receiving considerable amounts of financial aid warrants a closer investigation of the sources of that aid.

ACT and SAT scores could be further clarified, perhaps across score categories. Ultimately, it is important to keep in mind that homeschoolers do not consistently participate in testing (Welner K. M. & Welner K. G., 1999; Franzosa S. D., 1991). Combined with patchwork reporting methods, it is difficult to draw generalized conclusions about the test scores of homeschoolers. It would be interesting to find out why fewer homeschoolers major in natural sciences or math-based fields. Previous research has identified a homeschool math gap (Gray D. W., 1998). which shows homeschoolers struggling more than their traditionally schooled peers with math; does this affect their choice of majors?

Far beyond the scope of this study, but crucial to having a better picture of homeschool graduates, is a more far-reaching survey that compares the experiences of homeschool graduates, both who go on to college and who do not. By only surveying college students and graduates, this survey may have identified mainly homeschool success stories, students who are potentially more intrinsically motivated, gifted learners, or benefited from more

parental support for higher education than their other homeschooled peers. Further research could shed light on differences among homeschool students, families, and learning environments that point to differences in long-term outcomes. This knowledge would allow for early interventions to promote greater academic success for all students who are homeschooled.

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