

## Access and Opportunity at American Women's Colleges: Contemporary Findings

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**Abstract.** American women's colleges were founded to create access and opportunity for women in higher education, and 36 continue to operate toward that mission in 2020. While historical and anecdotal evidence shows the value of women's colleges, contemporary research about student demographics and outcomes at American women's colleges is limited. This study is designed to fill this gap in literature. It uses quantitative research methods to compare access and opportunity at American women's colleges to liberal arts colleges and public universities. The findings reveal that women's colleges are enrolling students similar in demographic profile to public universities (enrolling those who have been historically less well served by higher education) and achieving completion rates like liberal arts colleges (statistically higher than public universities). Women's colleges, then, continue to advance women's social and economic opportunity by providing access and achieving positive outcomes for women who are often underserved by higher education.

**Biography.** Kathryn A. E. Enke is Chief of Staff and Lead Title IX Coordinator at the College of Saint Benedict, a college for women. In this role, she ensures effective execution of presidential priorities and initiatives and provides strategic and confidential guidance to the president on a diverse range of institutional matters. She coordinates the work of the college's Board of Trustees and its committees, and, as lead Title IX coordinator, she oversees the college's policies, practices, and training related to sexual misconduct and sex discrimination. Enke earned a BA in history from the College of Saint Benedict, and an MA and PhD in educational policy and administration from the University of Minnesota, Twin Cities, with a specialization in higher education. Her research focuses broadly on the ways that individuals' identities mediate their experiences in higher education.

## INTRODUCTION

Historically, women's colleges played a vital role in providing higher education pathways for women in the United States. At a time when higher education was restricted to men, American women's colleges were founded to create access and opportunity for women in higher education. Today, women's colleges globally continue to educate hundreds of thousands of students every year, providing access in places where educational opportunities for women are few, creating welcoming campus climates for women, developing women leaders, empowering students and communities, and symbolizing women's potential (Renn, 2014). However, the contemporary narrative around American women's colleges is one of decline (e.g., Jaschik, 2017; Garsd, 2015), noting the waning number of women's colleges and questioning their ongoing relevance given that most college students are women.

As of 2020, there are 36 American women's colleges, down from 46 just six years ago,<sup>1</sup> and about 230 women's colleges in 1960 (Women's College Coalition, 2020). Many of the holdouts have updated their mission: to serve transgender students, to admit men in certain programs, or to partner or merge with other nearby men's and coeducational institutions. A complete list of American women's colleges as of October 1, 2019, is shared in Table 11.

This quantitative study explores the contemporary role of American women's colleges in providing access to and opportunity within higher education. As an alumna and employee of a women's college, I was frustrated by the lack of available data and the reliance on outdated and anecdotal evidence in making the case for single-sex higher education. And, as a scholar of women's experiences in higher education, my commitment to improving women's education—in all educational contexts—informed the research design. The purpose, then, is not a narrow defense of women's colleges in response to the narrative of decline, but instead to analyze and share quantitative data about the contemporary women's college experience.

## A BRIEF REVIEW OF LITERATURE

As the number of American women's colleges has declined, the research, too, around American women's colleges has been in decline. While significant positive effects of attending a women's college—including higher educational and occupational achievement among women's college graduates—are noted in multiple studies (e.g., Kim & Alvarez, 1995; Riordan, 1994; Smith, 1990; Solnick, 1995; Tidball, Smith, Tidball & Wolf-Wendel, 1999), these studies are now decades old. More recent attention focuses on women's colleges globally (Fischer, 2019; Renn, 2014) or the contemporary arguments against single-sex colleges (Miller-Bernal & Poulson, 2011). Research in K-12 educational settings generally conclude that gender-segregated schooling has negative rather than

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<sup>1</sup> Since 2014, eight women's colleges began admitting men into their daytime undergraduate programs: Columbia College (South Carolina) in 2020; University of Saint Joseph (Connecticut) in 2018; Midway University (Kentucky) in 2016; College of Saint Elizabeth (New Jersey) in 2015; Saint Mary-of-the-Woods College (Indiana) in 2015; Chatham University (Pennsylvania) in 2014; Pine Manor College (Massachusetts) in 2014; College of New Rochelle (New York) in 2016 (and merged into Mercy College in 2019). Since 2014, two women's colleges closed: Lexington College (Illinois) in 2014; Colorado Women's College ceased admitting students in 2015.

positive effects, including gender stereotyping (Fabes, Martin, Hanish, Galligan & Pahlke, 2015), heteronormativity (McCall, 2014), and institutional sexism (Halpern et al., 2011).

Limited recent research on experiences at American women's colleges finds that students at women's colleges are more engaged in their education than women at coeducational colleges and that transfer students, in particular, are more engaged at women's colleges than at coeducational colleges (Kinzie, Thomas, Palmer, Umbach, & Kuh, 2007). Reinforcing those findings, additional research suggests that faculty at women's colleges have significantly greater contact with students, diverse classroom interactions, and emphasis on intellectual skills than faculty at coeducational colleges (Laird, Niskodé-Dossett, & Garver, 2009).

### **Comparative Alumnae Research Study**

A Comparative Alumnae Research Study conducted in partnership with the Women's College Coalition (Hardwick-Day, 2012) used interview data to compare the experiences of alumnae from the graduating classes of 1990-2006 from women's colleges to alumnae from those same class years at four-year liberal arts colleges and a public university group. Within this study, women's college alumnae were more likely than their peers at the comparison colleges to report that they earned a bachelor's degree in four years or less, earned a graduate degree, and were "completely satisfied" with the overall quality of their education. The results indicated that alumnae of women's colleges graduating between 1990 and 2006 view their education positively and point to practically significant ways that their women's college experience positively impacted their lives, leadership, and worldviews.

These data, while compelling, are self-reported, and may be impacted by alumnae nostalgia about their women's college experiences and defensiveness about those experiences given the public narrative around the decline of the sector. In addition, the study notes several meaningful differences in experience that were attributed to women's colleges but could also be replicated in coeducational environments: for example, women's college alumnae indicated they were more likely than alumnae in the public university group to have lived on campus all four years, an experience positively correlated with other kinds of engagement on campus (Pascarella & Terenzini, 2005).

The comparison groups used in the Comparative Alumnae Research Study are notable. Public universities provide a relevant comparison because of the important ways they differ from both women's colleges and liberal arts colleges: in size, institutional control, graduation and retention rates, and institutional focus. Given these factors, we might expect to observe differences in access and opportunity between institutional contexts. And, four-year liberal arts colleges provide a relevant comparison group because nearly half of remaining women's colleges (16 of 36) are classified by The Carnegie Classification of Institutions (2015) as Baccalaureate Colleges: Arts & Science Focus. We might expect access and opportunity at liberal arts colleges and women's colleges to be somewhat similar given these factors.

## **Liberal Arts Colleges**

Liberal arts colleges are strictly defined based on the number of students who pursue certain subjects of study. In practice, liberal arts colleges are committed to undergraduate education in small residential living and learning environments. Liberal arts colleges generally enroll between 500 and 3,000 students each. They stress the importance of student-faculty relationships; faculty members are committed to their teaching and advising roles and class sizes are small (Annapolis Group, n.d.). Liberal arts colleges generally require a set of core courses that are deemed essential to a broad-based education. An emphasis on liberal education is not exclusive to liberal arts colleges, but such an emphasis is most likely to occur at liberal arts colleges (Impacts, 2005).

It is clear from decades of research that liberal arts colleges provide distinctive benefits to students (Astin, 1999; Canada, 1999; Impacts, 2005; Kuh & Umbach, 2004; Pascarella & Terenzini, 2005; Pascarella, Wolniak, Cruce, & Blaich, 2004; Umbach & Kuh, 2006). For example, after controlling for confounding influences, Pascarella et al. (2004) determined that liberal arts colleges performed significantly better than research universities and regional institutions on nearly all Chickering and Gamson's (1991) good practices for undergraduate education during a student's first year. As an overlapping subset of colleges, though, there is little updated information about the distinctive benefits (or disadvantages, for that matter) of women's liberal arts colleges.

## **Access**

As noted above, women's colleges' historical missions were to provide access to a group of students underserved by other sectors of higher education. While women students are no longer underrepresented in higher education—the number of women in higher education has exceeded the number of men for five decades (U.S. Department of Education, 2019)—there are plenty of women that continue to be underserved, including women of color, nontraditional aged college students and low-income students. For the purposes of this study, then, I considered the demographic and academic characteristics of women at American women's colleges compared to other types of colleges in the United States, including variables like race/ethnicity, age, socioeconomic status, and SAT and ACT scores.

## **Opportunity**

Further, to extend the findings of the Hardwick-Day (2012) study, I sought quantitative data that would not rely on alumnae self-reporting to measure the opportunity effects of college. Retention and completion rates are one measure of opportunity: that is, the full advantages of college are not fully realized until a student persists in and completes a degree program. In addition, women have historically been underrepresented in science, technology, engineering, and mathematics (STEM) fields, and this has been an area of national interest in recent years. One might expect women's colleges to play a role in closing that gender gap, as a way of expanding opportunity for women.

Social mobility rankings provide another measure. Opportunity Insights (Chetty, Friedman, Saez, Turner & Yagan, 2017), in part, provides estimates about which

colleges in America contribute the most to intergenerational mobility. Opportunity Insights, a non-partisan non-profit at Harvard University that uses “big data” to inform policy changes to improve economic mobility, estimates and makes publicly available statistics on students’ earnings in their early thirties and their parents’ incomes. The “mobility rating” of each college, accounting for the percent of students who have parents in the bottom 20% of the income distribution and reach the top 20% of the income distribution after graduation, is a particularly useful way to assess the ways that colleges contribute to social mobility and opportunity. This study uses the Opportunity Insights data set provided publicly at <https://opportunityinsights.org/> to interrogate, specifically, the role that American women’s colleges play in advancing women’s success and economic opportunity.

## METHODS

This study uses quantitative research methods to provide more contemporary information about access and opportunity at American women’s colleges. | It focuses on two primary research questions: (1) What role do American women’s colleges play today in providing access to higher education? and (2) What role do American women’s colleges play today in advancing women’s success and economic opportunity? (See Table 1 for primary and secondary research questions.)

**TABLE 1. RESEARCH QUESTIONS**

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What role do American women’s colleges play in providing access to higher education?

- How do students at American women’s colleges compare demographically to women at other types of colleges in the United States (i.e. race/ethnicity, age, socioeconomic status)?
- How do students at American women’s colleges compare academically to women at other types of colleges in the United States (i.e. SAT and ACT standardized test scores)?

What role do American women’s colleges play today in advancing women’s success and economic opportunity?

- How do retention and completion rates at America’s women’s colleges compare to retention and completion rates at other types of colleges in the United States?
  - How do retention and completion rates of students from traditionally underrepresented groups compare (i.e. Pell Grant recipients, American Students of Color)?
  - How do the number of degrees conferred by women’s colleges in STEM fields compare to the number of degrees conferred to women in STEM fields at other types of colleges in the United States?
  - How do women’s colleges’ social mobility ratings (percent of students who have parents in the bottom 20% of the income distribution and reach the top 20% of the income distribution) compare to mobility ratings at other types of colleges in the United States?
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## Procedures

I used publicly available data to compare the demographic and academic characteristics of students at American women's colleges to students at two other groups of educational higher education institutions. I constructed two comparison groups following on the example of Hardwick-Day (2012): I defined a population of "liberal arts colleges" to include all four-year institutions classified by The Carnegie Classification of Institutions (2015) as Baccalaureate Colleges: Arts & Science Focus (N = 226). These colleges emphasizes undergraduate education, award at least 50% of their degrees in fields classified as liberal arts and are ranked as National Liberal Arts Colleges by the *U.S. News Best College* rankings. And, I defined a "public universities" group to include all four-year public nonprofit institutions that are not fully online (N = 556). The group includes baccalaureate, master's and doctorate institutions, as well as special focus schools and tribal colleges that offer baccalaureate degrees or above.

I extracted 2017-18 data for 34 American women's colleges and the above-described comparison groups from the Integrated Postsecondary Education Data System (IPEDS; U.S. Department of Education, 2019). The two additional existing women's colleges (Douglass Residential College of Rutgers University and Russell Sage College of the Sage Colleges) reported data only as part of larger systems, so relevant data was not publicly available. I also extracted mobility ratings from Opportunity Insights (Chetty et al., 2017); mobility ratings were calculated for over 2,200 colleges and universities, including 27 of the 36 women's colleges.

I used one-way analyses of variance (ANOVAs) to examine whether American women's colleges differ from liberal arts colleges and/or public universities with respect to the following research variables: student age; student race and ethnicity; student socioeconomic status; student standardized test scores; retention; completion; degrees earned in STEM fields; and social mobility rating.

The Shapiro-Wilk test for normality (Shapiro & Wilk, 1965) indicated that not all variables were normally distributed for the women's college and comparison groups, and *Levene's F* test (Levene, 1960) indicated that the variances of some variables were not homogenous. As such, *Welch's F* test (Welch, 1947) was used to assess statistically significant main effects, with an alpha level of .05 for all analyses. Post hoc comparisons using the Games-Howell post hoc procedure (Games & Howell, 1976) were conducted to determine which pairs of colleges differed significantly. Within this paper, results focus on the differences between women's colleges and one or both comparison groups.

These procedures lead to findings that are contemporary (using the most recently available data), easily replicable (using standardized and publicly available data) and easy to understand (using simple statistical methods), thus maximizing study validity.

## FINDINGS

### Access

Analyses show that students at American women’s colleges differ demographically from women at liberal arts colleges nationally, and are, on average, more comparable in selected demographic characteristics to students at public universities. See descriptive statistics in Table 2. Academically, students at American women’s colleges are not significantly different than students at liberal arts colleges or public universities.

**TABLE 2. DEMOGRAPHIC CHARACTERISTICS OF WOMEN IN COLLEGE**

	Women’s Colleges	Liberal Arts Colleges	Public Universities
<b>AGE OF UNDERGRADUATE WOMEN, 2017</b>			
Under 18 years	3.0%	3.2%	5.1%*
18-24 years	50.6%	90.9%*	77.5%
25-65 years	16.6%	6.0%*	17.2%
Over 65 years	0.2%	0.3%*	0.2%
<b>RACE/ETHNICITY OF UNDERGRADUATE WOMEN, 2017</b>			
American Indian/Alaska Native	0.4%	0.6%	1.2%*
Asian/Native Hawaiian/Pacific Islander	6.0%	4.1%	5.0%
Black/African American	18.5%	11.7%	14.4%
Hispanic/Latino(a)**	12.8%	8.4%	13.2%
White	49.8%	61.5%*	56.4%
2 or more races	4.2%	3.4%	3.9%
Race/ethnicity unknown	3.3%	4.9%	3.1%
Nonresident alien	5.0%	5.1%	2.8%
<b>SELECTED GROUPS, AS A PERCENTAGE OF UNDERGRADUATE WOMEN OF KNOWN RACE, 2017</b>			
American women of color	43.5%	29.9%*	39.0%
White	51.3%	64.8%*	58.2%
Nonresident alien	5.2%	5.3%	2.8%
<b>SOCIOECONOMIC STATUS OF FULL-TIME FIRST-TIME UNDERGRADUATES, 2016-2017</b>			
Mean percentage awarded Pell Grants	43.2%	32.6%*	40.3%

Source: IPEDS, 2019.

\* The mean is significantly different than women’s colleges, at the 0.05 level. Only significant differences between the comparison groups and women’s colleges are noted. Additional significant differences were noted between liberal arts colleges and public universities. Meaningful differences in the context of this study of women’s colleges are addressed within the text.

\*\* Hispanic/Latino(a) is the category reported within IPEDS, so it will be used within this paper.

AGE. One-way ANOVAs for each of four age ranges indicated statistically significant main effects, indicating that not all groups had the same percentage of students under 18 years, 18-24 years, 25-65 years, or over 65 years. Post hoc comparisons were conducted to determine which pairs of colleges differed significantly for each age range. These results are given in Table 3. Undergraduate women at women’s colleges are statistically more likely to be 25-64 years old than undergraduate women at liberal arts colleges (16.6% vs. 6.0%), and statistically less likely to be 18-24 years old (50.6% vs. 90.9%) or over 65 years (0.2% vs. 0.3%). Because of the small percentages of students over 65 years in all study groups, in general women’s college students are more likely to be older than liberal arts college students are, whereas liberal arts college students are more likely to be traditional college-aged students than women’s college students are.

**TABLE 3. POST HOC RESULTS FOR AGE OF UNDERGRADUATE WOMEN, 2017**

	DIFFERENCE IN MEANS (I - J)			
	J.	Women’s Colleges	Liberal Arts Colleges	Public Universities
PERCENTAGE UNDER 18 YEARS, WELCH’S $F(2, 91.20) = 7.70, P < .05$				
I. Women’s Colleges ( $M = 3.0$ )		–		
Liberal Arts Colleges ( $M = 3.2$ )		0.3	–	
Public Universities ( $M = 5.2$ )		2.2*	1.9*	–
PERCENTAGE 18-24 YEARS, WELCH’S $F(2, 87.82) = 68.61, P < .001$				
I. Women’s Colleges ( $M = 80.6$ )		–		
Liberal Arts Colleges ( $M = 90.9$ )		10.4*	–	
Public Universities ( $M = 77.5$ )		-3.1	-13.4***	–
PERCENTAGE 25-64 YEARS, WELCH’S $F(2, 85.84) = 65.91, P < .001$				
Women’s Colleges ( $M = .6.6$ )		–		
Liberal Arts Colleges ( $M = 6.0$ )		-10.6*	–	
Public Universities ( $M = 17.2$ )		0.6	11.2***	–
PERCENTAGE OVER 65 YEARS, WELCH’S $F(2, 68.39) = 3.28, P < .05$				
Women’s Colleges ( $M = 0.2$ )		–		
Liberal Arts Colleges ( $M = 0.3$ )		0.2*	–	
Public Universities ( $M = 0.2$ )		0.1	-0.1	–

\*  $p < .05$ , \*\*\*  $p < .001$

RACE AND ETHNICITY. Similarly, one-way ANOVAs indicated statistically significant main effects for the percentages of American women of color, white women, and nonresident alien women, among undergraduate women of known race. Post hoc comparisons were conducted to determine which pairs of colleges differed significantly for each selected group. These results are given in Table 4. Women’s colleges enroll a statistically higher percentage of undergraduate women of color than liberal arts colleges (43.4% vs. 29.9%). The race/ethnicity profile of undergraduate women at women’s colleges is similar to the profile at public universities nationally (43.4% American students of color at women’s colleges vs. 39.0% American students of color at public universities).

**TABLE 4. POST HOC RESULTS FOR SELECTED GROUPS AS A PERCENTAGE OF UNDERGRADUATE WOMEN OF KNOWN RACE, 2017**

	DIFFERENCE IN MEANS (I - J)			
	J.	Women’s Colleges	Liberal Arts Colleges	Public Universities
PERCENTAGE AMERICAN WOMEN OF COLOR, <i>WELCH’S F</i> (2, 89.05) = 14.57, <i>P</i> < .001				
I. Women’s Colleges (M = 43.5)		–		
Liberal Arts Colleges (M = 29.9)		-13.6*	–	
Public Universities (M = 39.0)		-4.5	9.1***	–
PERCENTAGE WHITE WOMEN, <i>WELCH’S F</i> (2, 89.78) = 9.20, <i>P</i> < .001				
Women’s Colleges (M = 51.3)		–		
Liberal Arts Colleges (M = 64.8)		13.4*	–	
Public Universities (M = 58.2)		6.8	-6.6*	–
PERCENTAGE NONRESIDENT ALIEN WOMEN, <i>WELCH’S F</i> (2, 79.93) = 18.21, <i>P</i> < .001				
Women’s Colleges (M = 5.0)		–		
Liberal Arts Colleges (M = 5.1)		0.1	–	
Public Universities (M = 2.8)		-2.2	-2.3***	–

\* *p* < .05, \*\*\* *p* < .001

SOCIOECONOMIC STATUS. With regard to the socioeconomic status of students, a one-way ANOVA indicated a statistically significant main effect, indicating that not all groups of colleges included in the study had the same percentage of students awarded Pell Grants in 2016-2017. Post hoc comparisons were conducted to determine which pairs of colleges differed significantly, and these results are given in Table 5. Full-time first-time undergraduates at women’s colleges are significantly more likely to have been awarded a Pell Grant than students at liberal arts colleges (43.2% vs. 32.6%), indicating that students at women’s colleges are more likely to come from families with limited financial means. On this variable, the socioeconomic profile of full-time first-time undergraduates at women’s colleges is similar to public universities.

**TABLE 5. POST HOC RESULTS FOR SOCIOECONOMIC STATUS OF FULL-TIME FIRST-TIME UNDERGRADUATES, 2016-2017**

	DIFFERENCE IN MEANS (I - J)			
	J.	Women's Colleges	Liberal Arts Colleges	Public Universities
PERCENTAGE AWARDED PELL GRANTS, WELCH'S $F(2, 85.85) = 13.98, P < .001$				
I. Women's Colleges (M = 43.2)		–		
Liberal Arts Colleges (M = 32.6)		-10.65*	–	
Public Universities (M = 40.3)		-2.89	7.76***	–

\*  $p < .05$ , \*\*\*  $p < .001$

**STANDARDIZED TEST SCORES.** Scores on the ACT and SAT standardized tests are one proxy for academic status. One-way ANOVAs of average composite ACT, SAT math, and SAT evidence-based reading and writing scores for first-year students indicated a statistically significant main effect, indicating that not all groups of colleges included in the study had the same percentile scores on these tests. Post hoc comparisons indicated that only the liberal arts colleges and public universities groups differed on these variables, so these statistical results are not detailed within this paper. As noted above, academically, students at American women's colleges are not significantly different than students at liberal arts colleges or public universities. Average composite, math, and reading and writing scores on the ACT and SAT standardized tests for first-year students at women's colleges fall in between averages for students at liberal arts colleges and public universities (with students at liberal arts colleges scoring significantly higher than students at public universities).

### Opportunity

The ways that college attendance contributes to opportunity can be measured in multiple ways. As noted in Table 1, this study measures opportunity in terms of retention and completion rates, degree conferral in STEM, and social mobility.

**RETENTION.** Retention rates measure the persistence of students from first year to second year of college. A one-way ANOVA of retention rates indicated no significant differences in retention for part-time students at the three types of colleges (*Welch's*  $F(2, 29.51) = 2.11, p = .139$ ). See descriptive statistics in Table 6. A similar analysis indicated statistically significant main effects for full-time students (*Welch's*  $F(2, 85.53) = 9.58, p < .001$ ). Post hoc comparisons indicated that the retention rate for full-time students at liberal arts colleges was significantly higher than at public universities, but neither comparison group differed from women's college retention rates in a statistically significant way.

**TABLE 6. 2017 RETENTION RATES OF ALL STUDENTS**

	Women's Colleges	Liberal Arts Colleges	Public Universities
Full-time students	77.3%	79.8%	75.7%
Part-time students	36.3%	39.9%	47.8%

Source: IPEDS, 2019.

COMPLETION. For this study, completion rates were measured as graduation with a bachelor's degree within six years of beginning college. Mirroring national trends, completion rates at each of the college groups varied by demographic characteristics of students. See descriptive statistics in Table 7.

One-way ANOVAs of completion rates were conducted for all women at the three types of colleges, by each race/ethnicity group reported within IPEDS, and for Pell Grant recipients. Statistically significant main effects emerged in all analyses, indicating that not all types of colleges had the same completion rates for any of the demographic subgroups. Post hoc comparisons were conducted to determine which pairs of colleges differed significantly for each demographic variable. These results are given in Table 8.

There was a significant difference in the six-year bachelor's degree completion rates for women at women's colleges and women at public universities (62.2% vs. 54.0%). Completion rates for women at women's colleges were statistically similar to women students at liberal arts colleges (68.9%).

**TABLE 7. 2017 COMPLETION RATES OF ALL STUDENTS – BACHELOR'S DEGREE WITHIN SIX YEARS**

	Women's Colleges	Liberal Arts Colleges	Public Universities
All women	62.2%	68.9%	54.0%*
BY RACE/ETHNICITY			
American Indian	42.3%	53.5%	41.1%
Asian/Native Hawaiian/Pacific Islander	62.3%	67.9%	53.7%
Black/African American	54.8%	56.7%	40.0%*
Hispanic/Latino(a)	63.2%	62.2%	44.9%*
White	63.1%	67.8%	53.0%*
2 or more races	54.3%	64.4%	45.5%
Race/ethnicity unknown	51.3%	61.4%	49.6%
Nonresident alien	74.0%	69.7%	57.2%*
BY PELL GRANT STATUS			
Pell Grant recipients	59.9%	61.4%	45.2%*

Source: IPEDS, 2019.

\* The mean is significantly different than women's colleges, at the 0.05 level. Only significant differences between the comparison groups and women's colleges are noted. Additional significant differences were noted between liberal arts colleges and public universities. Meaningful differences in the context of this study of women's colleges are addressed within the text.

**TABLE 8. POST HOC RESULTS FOR 2017 SIX-YEAR COMPLETION RATES OF ALL STUDENTS BY SELECTED GROUPS**

	DIFFERENCE IN MEANS (I - J)			
	J.	Women's Colleges	Liberal Arts Colleges	Public Universities
ALL WOMEN, WELCH'S $F(2, 87.91) = 50.13, P < .001$				
I. Women's Colleges ( $M = 62.2$ )		–		
Liberal Arts Colleges ( $M = 68.9$ )		6.7	–	
Public Universities ( $M = 54.0$ )		-8.2*	-14.9***	–
AMERICAN INDIAN STUDENTS, WELCH'S $F(2, 38.12) = 4.79, P < .05$				
Women's Colleges ( $M = 42.3$ )		–		
Liberal Arts Colleges ( $M = 53.5$ )		11.1	–	
Public Universities ( $M = 41.1$ )		-1.3	-12.4*	–
ASIAN/NATIVE HAWAIIAN/PACIFIC ISLANDER STUDENTS, WELCH'S $F(2, 78.40) = 22.46, P < .001$				
Women's Colleges ( $M = 62.3$ )		–		
Liberal Arts Colleges ( $M = 67.9$ )		5.5	–	
Public Universities ( $M = 53.7$ )		-8.7	-14.2***	–
BLACK/AFRICAN AMERICAN STUDENTS, WELCH'S $F(2, 82.63) = 41.75, P < .001$				
Women's Colleges ( $M = 54.8$ )		–		
Liberal Arts Colleges ( $M = 56.7$ )		2.0	–	
Public Universities ( $M = 40.0$ )		-14.7*	-16.7***	–
HISPANIC/LATINO(A) STUDENTS, WELCH'S $F(2, 82.70) = 45.71, P < .001$				
Women's Colleges ( $M = 63.2$ )		–		
Liberal Arts Colleges ( $M = 62.2$ )		-.9	–	
Public Universities ( $M = 44.9$ )		-18.2***	-17.3***	–
WHITE STUDENTS, WELCH'S $F(2, 81.4) = 42.26, P < .001$				
I. Women's Colleges ( $M = 63.1$ )		–		
Liberal Arts Colleges ( $M = 67.8$ )		4.7	–	
Public Universities ( $M = 53.0$ )		-10.1*	-14.7***	–
STUDENTS OF 2 OR MORE RACES, WELCH'S $F(2, 89.78) = 9.20, P < .001$				
Women's Colleges ( $M = 51.3$ )		–		
Liberal Arts Colleges ( $M = 64.8$ )		13.4*	–	
Public Universities ( $M = 58.2$ )		6.8	-6.6*	–
STUDENTS WITH RACE/ETHNICITY UNKNOWN, WELCH'S $F(2, 76.02) = 36.52, P < .001$				
Women's Colleges ( $M = 54.3$ )		–		
Liberal Arts Colleges ( $M = 64.4$ )		10.1	–	
Public Universities ( $M = 45.5$ )		-8.8	-18.9***	–

NONRESIDENT ALIEN STUDENTS, WELCH'S  $F(2, 70.33) = 18.23, P < .001$

Women's Colleges ( $M = 74.0$ )	–		
Liberal Arts Colleges ( $M = 69.7$ )	-4.3*	–	
Public Universities ( $M = 57.2$ )	-16.8*	-12.4***	–
PELL GRANT RECIPIENTS, WELCH'S $F(2, 85.54) = 56.23, P < .001$			
Women's Colleges ( $M = 59.9$ )	–		
Liberal Arts Colleges ( $M = 61.4$ )	1.5	–	
Public Universities ( $M = 45.2$ )	-14.7***	-16.2***	–

\*  $p < .05$ , \*\*\*  $p < .001$

Six-year graduation rates at women's colleges were also significantly higher than at public universities for several groups of historically underserved students, including Black or African American students, Hispanic/Latino(a) students, nonresident alien students, and Pell Grant recipients. Completion rates for these groups at women's colleges are also similar to these groups at four-year liberal arts colleges. Furthermore, liberal arts colleges had a significantly better completion rate than both women's colleges and public universities for American Indian students, Asian American students, and students with race/ethnicity unknown.

We can then conclude that women's colleges are enrolling students similar in demographic profile to public universities (enrolling those who have been historically less well served by higher education) and achieving completion rates like liberal arts colleges (statistically higher than public universities).

STEM DEGREES. In order to assess the opportunity for women in STEM at women's colleges, liberal arts colleges, and public universities, I completed two analyses. See descriptive statistics in Table 9. First, I completed a one-way ANOVA of degrees conferred to women in STEM fields at the three types of colleges, as a percentage of all bachelor's degrees earned by women. A statistically significant main effect emerged, and post hoc comparisons were conducted to determine which pairs of colleges differed significantly. Second, I completed a one-way ANOVA of the percent of bachelor's degrees in STEM fields conferred to American women of color, among women of known race, at the three colleges. Again, a statistically significant main effect emerged, and post hoc comparisons were conducted to determine which pairs of colleges differed significantly. Results from all post hoc comparisons relative to women in STEM are given in Table 10.

**TABLE 9. 2008-09 DEGREES CONFERRED TO WOMEN IN STEM FIELDS**

	Women's Colleges	Liberal Arts Colleges	Public Universities
Degrees conferred to women in STEM fields, as a percent of all bachelor's degrees earned by women	10.8%	14.6%*	10.1%
Percent of bachelor's degrees in STEM fields conferred to American women of color (among women of known race)	34.2%	19.8%*	29.4%

Source: IPEDS, 2019.

\* The mean is significantly different than women's colleges, at the 0.05 level. Only significant differences between the comparison groups and women's colleges are noted. Additional significant differences were noted between liberal arts colleges and public universities. Meaningful differences in the context of this study of women's colleges are addressed within the text.

**TABLE 10. POST HOC RESULTS FOR 2008-09 DEGREES CONFERRED TO WOMEN IN STEM FIELDS**

	DIFFERENCE IN MEANS (I - J)		
	J. Women's Colleges	Liberal Arts Colleges	Public Universities
PERCENT OF ALL BACHELOR'S DEGREES TO WOMEN THAT WERE CONFERRED IN STEM FIELDS, <i>WELCH'S F</i> (2, 94.43) = 17.81, <i>P</i> < .001			
I. Women's Colleges ( <i>M</i> = 10.8)	–		
Liberal Arts Colleges ( <i>M</i> = 14.6)	3.8*	–	
Public Universities ( <i>M</i> = 10.1)	-0.7	-4.5***	–
PERCENT OF STEM BACHELOR'S DEGREES CONFERRED TO WOMEN OF COLOR, AMONG WOMEN OF KNOWN RACE, <i>WELCH'S F</i> (2, 82.17) = 11.00, <i>P</i> < .001			
Women's Colleges ( <i>M</i> = 34.2)	–		
Liberal Arts Colleges ( <i>M</i> = 19.8)	-14.4*	–	
Public Universities ( <i>M</i> = 29.4)	-4.8	-9.5***	–

\* *p* < .05, \*\*\* *p* < .001

The percent of bachelor's degrees earned by women conferred in STEM fields in 2008-2009 was significantly lower at women's colleges than at liberal arts colleges (10.8% vs. 14.6%) and statistically similar to the rate at public universities (10.1%), which serve much larger numbers of students overall.

At the same time, the percent of bachelor's degrees in STEM fields conferred to American women of color, among women of known race, was significantly higher at women's colleges than at liberal arts colleges (34.2% vs. 19.8%), indicating a bright spot of success that is partially due to the strong performance of the historically Black women's college Spelman College, which accounts for over half (53.2%) of STEM degrees conferred to women at American women's colleges. Again, the percent of bachelor's degrees in STEM

fields conferred to American women of color, among women of known race, was similar at women's colleges and public universities (29.4%), which serve much larger numbers of students overall.

**SOCIAL MOBILITY.** For this variable, women's colleges were compared to all other colleges and to mobility ratings for those who did not attend college or went to college later. A one-way ANOVA of social mobility ratings revealed a statistically significant main effect (*Welch's*  $F(2, 30.84) = 126.60, p < .001$ ), and post hoc comparisons were conducted to determine which pairs differed significantly.

There was no significant difference in mobility ratings for women's colleges than for all other colleges. The mean mobility rating (Chetty et al., 2017) for women's colleges was slightly higher than the mean mobility rating for all other kinds of colleges (2.11 vs. 1.82), but well within the standard deviation for the population ( $SD = 1.31$ ).

There was a significant difference between women's colleges and no college ( $p < .05$ ) and a significant difference between all other colleges and no college ( $p < .001$ ). Therefore, mobility is correlated with going to college, generally, matching the findings of Chetty and his colleagues (2007).

Chetty and his co-authors note that variations in mobility rates across colleges do not correlate with differences in fields of study, public/private control, selectivity, completion rates, or cost of attendance. Therefore, the authors caution readers to use mobility to assess specific colleges, not make general comparisons about groups of colleges. While the mobility ratings for individual women's colleges varied widely, sixteen women's colleges (63%) had a mobility rating higher than the median for all rated colleges. Mobility ratings for individual women's colleges are noted in Table 11. A key standout is Mount Saint Mary's University, with a mobility rating within the top 40 nationally.

**TABLE 11. MOBILITY RATINGS OF AMERICAN WOMEN'S COLLEGES, JUNE 2019**

INSTITUTION	LOCATION	MOBILITY RATING*
Agnes Scott College	Georgia	1.474416
Alverno College	Wisconsin	<b>2.660782</b>
Barnard College	New York	<b>3.454579</b>
Bay Path University	Massachusetts	1.704366
Bennett College	North Carolina	<b>3.884872</b>
Brenau University	Georgia	<b>2.090932</b>
Bryn Mawr College	Pennsylvania	<b>1.826379</b>
Cedar Crest College	Pennsylvania	N/A
College of Saint Benedict	Minnesota	1.240949
College of Saint Mary	Nebraska	N/A
Converse College	South Carolina	0.690211
Cottey College	Missouri	N/A
Douglass Residential College of Rutgers University	New Jersey	N/A
Hollins University	Virginia	1.057432
Judson College	Alabama	N/A
Mary Baldwin University	Virginia	1.197596
Meredith College	North Carolina	1.278232
Mills College	California	<b>3.286253</b>
Moore College of Art and Design	Pennsylvania	N/A
Mount Holyoke College	Massachusetts	<b>2.598581</b>
Mount Saint Mary's University	California	<b>6.388687</b>
Notre Dame of Maryland University	Maryland	<b>2.240082</b>
Russell Sage College of the Sage Colleges	New York	N/A
Saint Mary's College	Indiana	0.621336
Salem College	North Carolina	0.848086
Scripps College	California	<b>2.518584</b>
Simmons College	Massachusetts	<b>2.320686</b>
Smith College	Massachusetts	<b>1.8842866</b>
Spelman College	Georgia	<b>3.288828</b>
St. Catherine University	Minnesota	<b>2.049412</b>
Stephens College	Missouri	0.71729
Sweet Briar College	Virginia	0.807196
Texas Woman's University	Texas	<b>2.534088</b>
Trinity Washington University	District of Columbia	N/A
Wellesley College	Massachusetts	<b>2.408345</b>
Wesleyan College	Georgia	N/A

Source: Women's College Coalition, 2019; Chetty et al., 2017.

\* Mobility rankings above the mean for all colleges nationally are bolded.

## DISCUSSION

So, what role do American women's colleges play today in providing access to higher education? This study shows that students at American women's colleges are demographically similar to students at public universities. When compared to students at liberal arts colleges, students at women's colleges are older, more likely to be women of color, and more often from families with limited financial resources. American women's colleges, then, join public universities in creating an access route to higher education for students in these groups.

Given this important access role, we might expect to see differences in academic preparation among new students at women's colleges and liberal arts colleges. Indeed, the data above show that students at liberal arts colleges score significantly higher than students at public universities on the ACT and SAT standardized tests. However, standardized test scores for students at American women's colleges are not significantly different than students at either liberal arts colleges or public universities. ACT and SAT standardized test scores for first-year students at women's colleges fall in between averages for students at liberal arts colleges and public universities.

What role do American women's colleges play today in advancing women's success and economic opportunity? We might expect to see more limited outcomes from women's colleges when compared to liberal arts colleges, given the systematic differences in experiences and outcomes for nontraditional aged college students, people of color, and low-income students. However, retention rates at women's colleges are comparable to retention rates at both liberal arts colleges and public universities. Further, six-year graduation rates at women's colleges are similar to graduation rates at liberal arts colleges and significantly higher than at public universities—indicating a better than expected opportunity for students to complete their degrees at women's colleges.

Six-year graduation rates are also significantly higher at women's colleges than at public universities for the following groups of historically underserved students: women, Black/African American students, Hispanic/Latino(a) students, white students, nonresident alien students, and Pell Grant recipients. The completion rates for these groups of students are statistically no different from liberal arts colleges, who have some of the highest success rates of any type of higher education.

While all degree completions represent a positive opportunity, particular national interest has been paid to the number of bachelor's degrees in STEM fields earned by women. In total, similar percentages of bachelor's degrees in STEM fields were conferred to women at women's colleges and public universities, and the percent of bachelor's degrees in STEM fields earned by women is significantly higher at liberal arts colleges than at women's colleges or public universities.

At the same time, the percent of bachelor's degrees in STEM fields conferred to American women of color, among women of known race, was significantly higher at women's colleges and public universities than at liberal arts colleges.

Similar percentages of bachelor's degrees in STEM fields were conferred to women of color at women's colleges and public universities. Again, this reinforces the narrative that women's colleges provide broader access than liberal arts colleges with similar opportunity, or, alternatively, the narrative that women's colleges provide similar access as public universities with the outcomes expected from more selective liberal arts colleges.

Given the findings above, one might hypothesize that women's colleges help disadvantaged students achieve above average outcomes. But, does that translate into economic and social mobility? As noted above, there was no significant difference in mobility ratings for women's colleges than for other colleges. However, mobility is correlated with going to college, generally, so providing broader access to higher education for traditionally underserved women plays an important role in economic mobility, no matter the educational institution or sector.

Future research could interrogate further the ways that women's colleges advance women's social and economic opportunity by considering shared aspects of public universities and women's colleges that lead to robust educational access, and shared aspects of liberal arts colleges and women's colleges that contribute to social mobility. Colleges across all sectors could consider whether strategies used by women's colleges to support access and opportunity for women could inform practices to support women at other types of institutions.

While the differences between liberal arts colleges and public universities were not a focus of this study, it is clear from the data within that there are important differences in access and opportunity within these sectors. Broadly, public universities provide greater access to women who are historically underserved, and liberal arts colleges provide greater opportunity for women as measured by successful college completion and degree attainment in STEM fields. The differences between liberal arts colleges and public universities was starker than differences between either comparison group and women's colleges.

Given some overlap in the liberal arts college and women's college groups, further research could examine what outcomes are unique to the women's college experience, and what outcomes are related to the liberal arts experience more directly. This is particularly important for those of us who seek to replicate the women's college experience and their intense focus on women's success within other institutional contexts.

Finally, the data compiled by Opportunity Insights (Chetty et al., 2017) are ripe for future research and for informing educational policy and practice. Examining trends among colleges that contribute to higher-than-average social mobility could help all colleges—including women's colleges—improve on this indicator.

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The Center for the Advancement of Women at Mount Saint Mary's launched *Collectif*, a digital research anthology, in 2018 as a companion piece to the University's annual Report on the Status of Women and Girls in California.™ *Collectif* is an anthology of original writing created by University faculty, students, and community partners.

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In 2019, the national WCC found a new home at the Center for the Advancement of Women at Mount Saint Mary's. As a WCC member university that has a vested interest in advancing women's education, the Center dedicates its third edition of *Collectif*—an online research anthology—to questions related to the relevance and utility of women's universities in the 21st century.

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