Women in the Economy Commission

UTAH WOMEN IN HIGHER EDUCATION, 2000-2017

A Report Using the American Community Survey, Integrated Postsecondary Education Data System, and Utah System of Higher Education Data

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About the Women in the Economy Commission

The Women in the Economy Commission increases public and government understanding of the current and future impact and needs of the state's women in the economy and how those needs may be most effectively and efficiently met. The commission identifies and recommends policies, procedures, and programs to respond to the rights, needs and impact of women. It facilitates coordination of the functions of public and private entities concerned with women in the economy.

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Introduction

Over the past several years, Utah men and women have made great strides toward increasing postsecondary educational attainment as an increasing proportion of adults hold a college degree or trade certificate. These efforts have brought the state closer to reaching its goal of 66% of the population holding a postsecondary degree or certificate by 2020.[1] Despite these gains, Utah faces a shortage of educated workers[2] and Utah consistently ranks at or near the bottom in evaluations of women's educational attainment[3] and equality[4] relative to other states.

In this report we outline findings of a year-long project, funded by the Utah Women in the Economy Commission, focused on understanding factors associated with enrollment, persistence, and graduation among Utah men and women between 2000-2017. We explored the answers to five broad questions.

Research Questions

1. How can we characterize the higher education context in Utah for men and women, and how has this changed over time?
2. How does women's postsecondary educational attainment in Utah compare to women's postsecondary educational attainment in the US? How has this changed over time?
3. What is the extent of women's educational attainment in Utah, including field of study, level, and institution?
4. What is the life course of students pursuing postsecondary certificates and degrees in Utah? What are the factors associated with persistence and completion?
5. How can we explain and reconcile different results from different data sources?

Our findings support other research showing progress toward postsecondary certificate and degree attainment, but we identify several key gaps in progress that keep Utah from reaching its educational and economic potential.

Data

We completed this research in three phases. We first performed an in-depth analysis of the American Community Survey (ACS), a survey that provides a continual "snapshot" of American households in 1-year, 3-year, and 5-year samples (Public-Use Microdata Samples, or PUMS)[5] between the years 2000-2016. We combined questions about student status and educational attainment with demographic information for men and women on age, marital status, Hispanic origin, birthplace, household composition, children, workforce participation, and economic status to better understand the factors associated with recent educational

participation among individuals and within households in Utah. This dataset provides invaluable insights at a *population* level.

In the second phase we analyzed Integrated Postsecondary Education Data System (IPEDS) data for the years 2000-2016 to provide an update to previous reports produced by the Office of the Utah Women and Education Project (now hosted under the Utah Women & Leadership Project). The IPEDS data is comprised of several surveys conducted by the National Center for Education Statistics (NCES) under the direction of the United States Department of Education.[6] These surveys are administered three times per year to every postsecondary institution that participates in federal student financial aid to document enrollments, completions, graduations, financial aid, and institutional characteristics. We used these data to discuss enrollment and completion trends for men and women across institutions and over time, garnering unique insights about Utah and US behavior from a *comparative* perspective.

Finally, we worked on site at the Utah System of Higher Education (USHE) offices to analyze individual- and institutional-level data on postsecondary educational activities between 2000-2017 at the eight public colleges and universities in Utah (Dixie State University, Salt Lake Community College, Snow College, Southern Utah University, The University of Utah, Utah State University, Utah Valley University, and Weber State University). We used these data to show demographic and educational differences across and within institutions over time, paying special attention to changes in participation and completion (including certificate/degree level and field of study) for men and women. These data were invaluable for providing an *individual-level* perspective (though all data were anonymized before reporting).

Outline of Report

In Section 1 we discuss our research using the ACS data. Since this is a population-level dataset, all statistics and comparisons represent the population as a whole (i.e., limited to students). From the ACS data we find that the gap between Utah men's and women's postsecondary enrollment has been decreasing over time, but enrollment patterns differ by age. Other demographic characteristics and family formation behaviors are also associated with enrollment in different ways for Utah men and women. Family formation behaviors are associated with more limited enrollment for Utah women compared to Utah men. We also find that a higher percentage of Utah adults are enrolled in postsecondary education compared to US adults. Utah adults are also reaching higher attainment compared to US adults; Utah men and women have about equal bachelor's degree attainment and are slightly higher than US men and women, and the percentage of Utah men with graduate degrees is higher than Utah women, US men, and US women (though the percentage of Utah women with graduate degrees is the lowest of these groups). As

with enrollment, demographic and family formation variables are differentially associated with attainment for Utah men and women.
In Section 2 we describe Utah postsecondary institutions using the IPEDS surveys to better understand how postsecondary educational activities at Utah institutions compare to those in the United States, and to show how participation in those activities has changed over time. We find that in recent years women represent more than half of enrolled students at private nonprofit and for-profit institutions, and they earn more than half of all degrees except for at the graduate level. Despite this, Utah ranks below nearly all states in terms of the percent of female enrollment, and women are the majority of enrollees in lower-paying fields of study.

In Section 3 we use USHE data to provide an individual-level perspective on postsecondary educational activities in Utah. We describe student registration status across institutions, paying special attention to how enrollment varies by gender and age. We also explore men's and women's fields of study, including whether students are pursing STEM or non-STEM majors. We also discuss completions and examine associations between student characteristics and the likelihood of finishing a certificate or degree. We find that men and women have different timelines for beginning, continuing, and completing postsecondary certificates and degrees. Women pursue lower-level certificates and degrees compared to men, and they pursue more gendered fields of study (e.g., education versus engineering).

We conclude this report by returning to the five questions listed in this introduction and summarizing our findings. We also identify questions that were beyond the scope of this project, and we make recommendations for future research. We end with several research-based recommendations that may enable men and women to make the postsecondary educational choices that are right for them and their families.

Section 1: Higher Education at the Population Level Using the American Community Survey

The American Community Survey (ACS) is a survey distributed to a sample of addresses in the United States. This survey is the modern iteration of the Census long form and is conducted continually, with different addresses being surveyed each month. These surveys are compiled into 1-year (12 months of data), 3-year (36 months of data), and 5-year (60 months of data).[7] Data are available for household- and person-level characteristics in pretabulated profiles or the Public Use Microdata Sample (PUMS) files.[8] In this research we primarily use PUMS data for more detailed analyses.[9]

ACS estimates are available from the years 2000-2015, though the surveys collected between 2000-2004 are considered experimental and do not follow the same sampling strategy as later years.[10] The Census provides weights to approximate population counts and to calculate standard errors (from 2005-2015). We use these weights for all reported estimates, using the person-level weight for 2001-2004[11] estimates and the replicate weights using Stata's survey design svyset function for 2005-2015 estimates.[12]

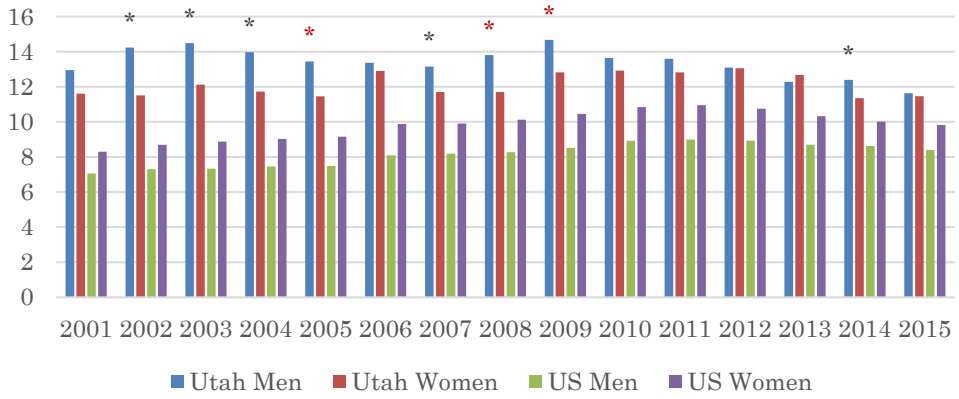
The ACS provides a continual "snapshot" of American households. Its one-year samples are ideal for showing change over time, and the 3- and 5-year samples are useful for validating trends and providing estimates more robust to sampling error. We use this survey to provide a picture of Utah's educational context over the past 15 years, both among individuals and within households. We also make comparisons on some items between Utah and US estimates.

The main education questions available in the ACS ask about student status and educational attainment.[13] These questions are listed in Appendix A. We combine these questions with demographic information for men and women on age, marital status, Hispanic origin, birthplace, household composition, children, workforce participation, and economic status to better understand the factors associated with recent educational participation in Utah. Selected tables for regression-based results are in Appendix B, and Stata commands for the analyses presented in this report are in Appendix C.

Student Status

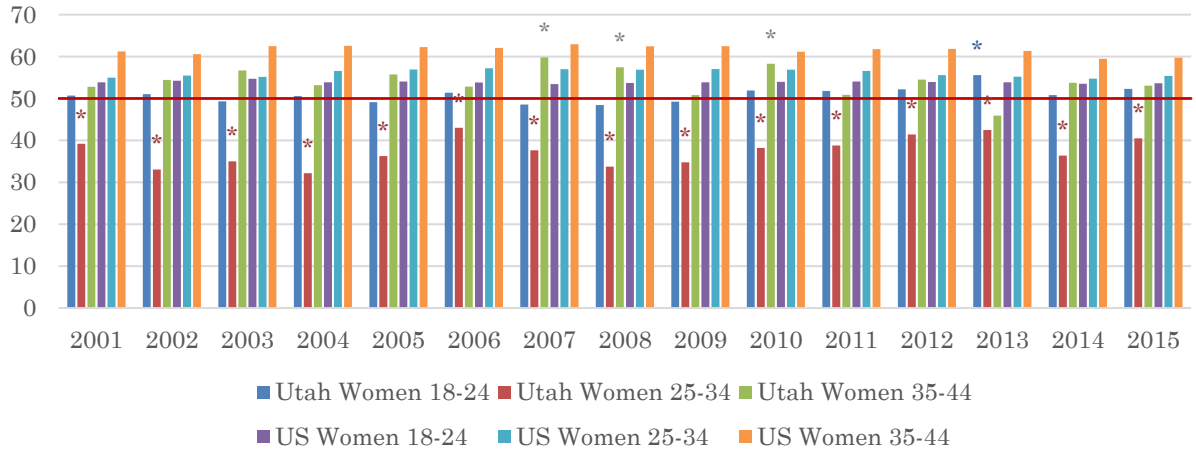
The percentage of adults 18+ in Utah who have been enrolled in postsecondary education in the past three months ranges from about 11.5-14.5% between 2001-2015. In most years a larger percentage of Utah men have been enrolled, but the differences between Utah men and women are only statistically significant[14] in the years 2002-2005, 2007-2009, and 2014 (Figure 1, statistical significance denoted by asterisks).

Figure 1. Percent of Adults 18+ Enrolled in Postsecondary Education in the Past 3 Months



Utah enrollment is further explained by age and other demographic characteristics. When accounting for age (Figure 2), the difference between men and women is only statistically significant in the years 2005, 2008, and 2009 (see asterisks, with Utah women being less likely to be enrolled than Utah men in each of these years). Additionally, men and women seem to have different enrollment patterns depending on their age group. Utah women are close to 50% of enrollees in the 18-24 age group. They are only 40% or less of enrollees in the 25-34 age group (where they also have the biggest gap compared to US women in that age group), but Utah women are more than half of enrollees in the 35-44 age group. Differences between Utah men and women are statistically significant in all years for the ages 25-34 and in select years for other age groups (see asterisks).

Figure 2. Women as a Percent of Adults 18+ Enrolled in Postsecondary Education in the Past 3 Months



These differences may reflect Utah cultural patterns such as LDS missions for young men (and increasingly young women), participation in childbearing for

women in their late 20s and early 30s, and graduate school degree attainment for Utah men. Table 1[15] lists the demographic and family characteristics we investigated as predictors of whether a Utah adult ages 25-34 had been enrolled in postsecondary education in the past 3 months between 2005-2015. These characteristics include Hispanic origin, whether the individual was born in Utah,[16] whether the individual's family income places them in the poverty category,[17] marital status, and whether the individual has his or her own children in the home. Accounting for these characteristics (as well as age and year) helps isolate the effect of being female; when we hold each of these characteristics constant, or "control for" them, we see that family formation and other activities are associated with the odds of being enrolled in postsecondary education. Based on the first row of Table 1 we can say that, accounting for the other characteristics in the table, the odds of being enrolled in postsecondary education are 40% lower for women ages 25-34 compared to men ages 25-34. That is, we see that there is a moderate difference between men's and women's enrollment in this age group that is *not* explained by these characteristics.[18]

Table 1. Amount of Change in Odds of Being Enrolled in Postsecondary Education for Characteristics of Utah Adults Ages 25-34, 2005-2015

	Utah Men	Utah Women
Being Female	--	40% lower
Hispanic origin*	59% lower odds	59% lower odds
Workforce participation	47% lower odds	2% higher odds
Born out of Utah	35% higher odds	35% higher odds
In poverty	49% higher odds	49% higher odds
Married (compared to never married)	51% higher odds	28% lower odds
Divorced/separated/widowed (compared to never married)	28% lower odds	28% lower odds
Living with own children under 5 years old	20% lower odds	51% lower odds

*We did not investigate whether the effect of Hispanic origin is different for men and women.

As expected, these characteristics are themselves associated with the likelihood of being enrolled in postsecondary education in the past 3 months, but many of these associations are different for men and women in the 25-34 age group. Specifically, as we explored the characteristics associated with enrollment in postsecondary education we found that some of the difference between Utah men and women is the

product of the different effects of marriage on men and women (see Appendix B; results in Table 2 are based on Model 7). Accounting for other characteristics, Utah men in this age group are less likely to be enrolled in postsecondary education if they are counted as being in the workforce; women are slightly more likely to be enrolled if they are in the workforce. Men are more likely to be enrolled in postsecondary education if they're married; Utah women are less likely to be enrolled if they're married. Having one's own children under 5 in the home is associated with lower odds of being enrolled for both men and women, but more so for women. These patterns persist even after accounting for different age patterns in enrollment and whether the individual lives in group quarters (e.g., a dorm).

The ACS is a cross-sectional survey (it doesn't follow the same individuals over time), so we can't determine the causal direction of these relationships. We don't know, for example, whether being enrolled in college makes a man more likely to get married. But our analyses suggest that the characteristics associated with men's and women's enrollment are cumulative and act to create the large differences we see in this age group. Table 2 lists the predicted probabilities (based on Model 7 in Appendix B) of being enrolled in postsecondary education for men and women with varying characteristics.

Table 2. Predicted Probabilities for Given Characteristics of Utah Men and Women in the 25-34 Age Group, 2005-2015

Age	Marital Status	Labor Force Status	Own Children Under 5 in Home	Men's Predicted Probability of Enrollment	Women's Predicted Probability of Enrollment
29	Not Married	Not in LF	No	0.228	0.150
29	Married	Not in LF	No	0.308	0.113
29	Not Married	In LF	No	0.137	0.153
29	Married	Not in LF	Yes	0.262	0.058

Models represented in this table are constrained to the same values for Hispanic origin, being born out of Utah, and being in poverty (0 for all). We use the age 29 because it is the average age of the individuals in the 25-34 age group.

The ACS also asks whether enrolled individuals are pursuing undergraduate or graduate education. For this we turn to the most recent 5-year sample (2010-2014) of the ACS for a larger sample size (only about 1-2% of adults in Utah have attended graduate school in the past 3 months). Among adults ages 25 and up who are pursuing postsecondary education, there is not a statistically significant

difference in the odds of men and women attending graduate school (versus an undergraduate program). However, women who are divorced, separated, or widowed or who have children under 5 in the home are less likely to be enrolled in graduate school compared to men with the same characteristics, and women who are in the labor force are more likely to be enrolled in graduate school compared to men in the labor force. Among all adults 25+ who have at least a bachelor's degree, women who have children under 5 in the home are less likely to be enrolled in graduate school compared to men with children under 5 in the home.

For women over age 25 who are enrolled in graduate school, 60% have a bachelor's degree and 30% have a master's degree. About 64% are married, and 24% have never been married. The average age is 38.76. The average number of children in the home is 1; 52% of women in this group have 0 children in the home, 16% have 1 child in the home, 15% have 2 children in the home, and 9% have 3 children in the home. The average age of the youngest child in the home (for women with a child in the home) is 10.58, though 30% of these women have a child younger than 5 at home.

For men over age 25 who are enrolled in graduate school, 57% have a bachelor's degree and 32% have a master's degree. About 77% are married, and 18% have never been married. The average age is 35.96. The average number of children in the home is 1.1; 43% of men in this group have 0 children in the home, 15% have 1 child in the home, 16% have 2 children in the home, and 9% have 3 children in the home. The average age of the youngest child in the home (for men with a child in the home) is 4.69. About 68% of men enrolled in graduate school in the past 3 months have a child younger than 5 at home.

Educational Attainment

Educational attainment in the ACS is straightforward; the highest year of education or degree is reported for each individual. Postsecondary education options include less than 1 year of college credit, 1 or more years of college credit but no degree, associate degree, bachelor's degree, master's degree, doctorate degree, and professional degree. In most tables and figures we report educational attainment for adults ages 25 and older to allow for completion time.

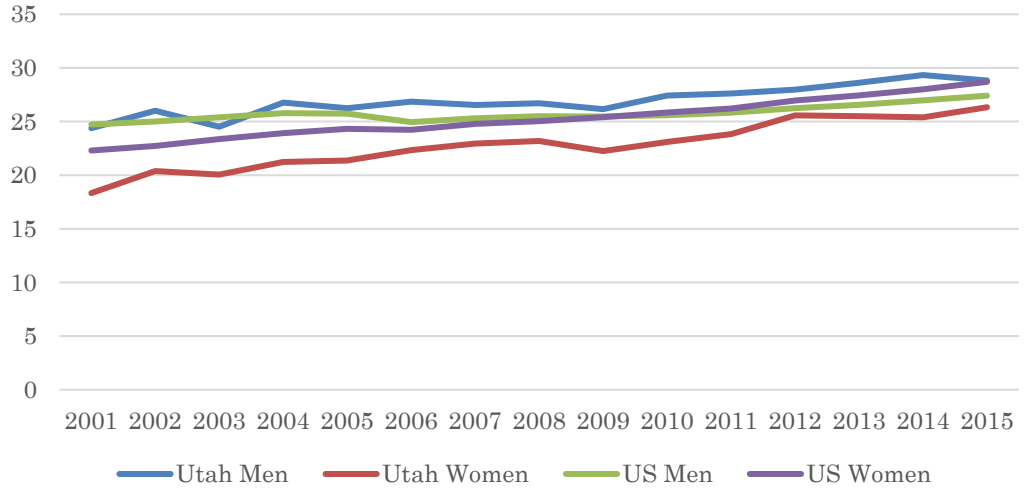
In the ACS data we see three main patterns for Utah men's and women's educational attainment from 2005-2015. First, a greater percentage of Utah women compared to Utah men fall into the "less than one year of college," "more than one year of college but no degree," and "associate degree" categories. The percentages of Utah women in these categories are also higher than US men and women (Table 3). Second, men and women are about equal in bachelor's degree attainment and are faring better in this category compared to US men and women. Third, men have historically surpassed women in graduate degree attainment, but that gap may be

shrinking. Despite this, when including graduate degrees Utah men have the highest educational levels compared to Utah women and US men and women, and Utah women have the lowest (Figure 3).

Table 3. Highest Level of Education for Utah and US Adults 25+ in 2015

	Utah Men	Utah Women	US Men	US Women
N/A or None	0.95	1.03	1.45	1.44
Didn't finish high school	7.93	6.87	12.08	10.74
High school degree or GED	23.69	24.44	28.31	26.79
< 1 year college	6.74	8.77	5.96	6.44
> 1 year college, no degree	18.8	18.86	14.52	14.61
Associate degree	8.12	10.5	7.33	9.05
Bachelor's degree	20.8	21.26	18.81	19.25
Master's degree	8.7	6.57	7.5	8.94
Professional degree	2.29	0.89	2.37	1.65
Doctorate degree	1.99	0.83	1.68	1.09

Figure 3. Percent of Adults 18+ Holding at Least a Bachelor's Degree



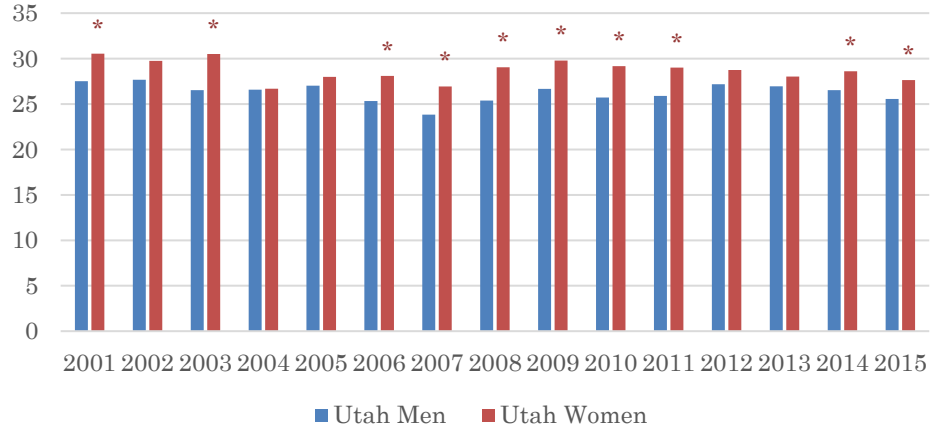
In our previous section we saw that men and women have near-equal enrollment at the earlier ages, but men have higher enrollment in the 25-34 age range and women have higher enrollment in the 35-44 age range. This led us to ask whether this educational attainment for men and women, particularly the bachelor's degree attainment, is happening on the same timeline for both groups. We also

investigated how demographic and family formation characteristics are associated with educational attainment.

Some College, No Degree

In most years between 2001-2015, the percentage of Utah women ages 25+ with some college but less than an associate degree is higher than that of Utah men (Figure 4, asterisks indicate statistical significance).

Figure 4. Percent of Utah Adults 25+ with Some College, No Degree



Women in this category also have a different relationship between educational attainment and family formation behaviors compared to men. The primary difference comes from the association between educational attainment and marriage. Table 4 lists the characteristics associated with having some college but no degree versus having an associate degree (column 2), a bachelor's degree (column 3), and a graduate degree (column 4). For each characteristic listed in the rows, the next three columns indicate whether Utah adults with this characteristic are more or less likely to have some college, no degree versus the three comparison categories. For example, women who are married are *more* likely to have some college, no degree than they are to have an associate's degree, a bachelor's degree, or a graduate degree. Men who are married are *less* likely to have some college, no degree than they are to have an associate's degree, a bachelor's degree, or a graduate degree. Women who are divorced are also *more* likely to be in this lowest attainment category, and women with young children in the home are *less* likely to be in this category.

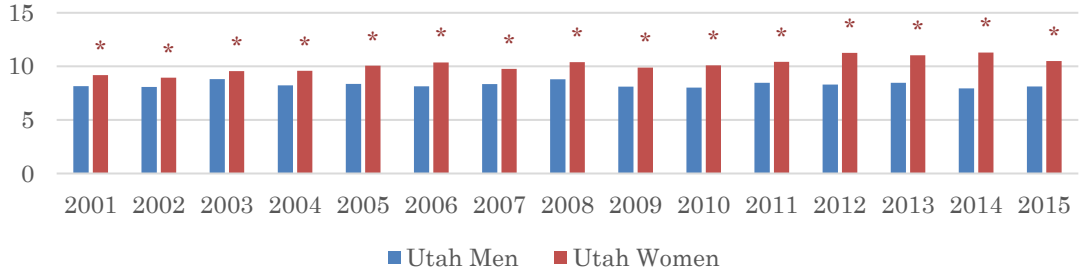
Table 4. Characteristics Associated with the Likelihood of Utah Adults 25+ Having Some College and No Degree, 2011-2014

	Compared to Associate Degree Holders	**Compared to Bachelor's Degree Holders**	**Compared to Graduate Degree Holders**
Female (vs male)	Less likely	Less likely	No difference
Hispanic origin (vs no Hispanic origin)	More likely	More likely	More likely
Labor force participation	No difference	Less likely	Less likely, especially for women
Born out of Utah (vs born in Utah)	No difference	Less likely	Less likely
In poverty (vs not in poverty)	More likely	More likely	More likely
Married (vs never married)	Less likely for men, more likely for women	Less likely for men, more likely for women	Less likely for men, more likely for women
Divorced, separated, or widowed (vs never married)	Less likely for men, more likely for women	More likely, especially for women	More likely, especially for women
Children under 5 in home (vs no children under 5 in home)	Less likely only for women	Less likely, especially for women	Less likely

Associate Degree

Utah women ages 25+ are increasingly earning associate degrees with a widening gap above Utah men (Figure 5, asterisks indicate statistical significance).

Figure 5. Percent of Utah Adults 25+ Holding Only an Associate Degree



Women are as likely to obtain a bachelor's degree as they are to obtain an associate degree, but they are more likely to obtain an associate degree than a graduate degree or no degree (Table 5). Again, we see that for women, being married (and also being divorced) is associated with having lower levels of postsecondary education.

Table 5. Characteristics Associated with the Likelihood of Utah Adults 25+ Having an Associate Degree, 2011-2014

	Compared to Some College, No Degree	**Compared to Bachelor's Degree Holders**	**Compared to Graduate Degree Holders**
Female (vs male)	More likely	No difference	More likely
Hispanic origin (vs no Hispanic origin)	Less likely	More likely	More likely
Labor force participation	More likely (only for women)	Less likely for men, more likely for women	Less likely, especially for women
Born out of Utah (vs born in Utah)	No difference	Less likely	Less likely
In poverty (vs not in poverty)	Less likely	More likely	More likely
Married (vs never married)	More likely for men, less likely for women	More likely	More likely only for women
Divorced, separated, or widowed (vs never married)	More likely for men, less likely for women	More likely	More likely, especially for women
Children under 5 in home (vs no children under 5 in home)	More likely only for women	Less likely	Less likely

Bachelor's Degree

The percentages of Utah men and women holding bachelor's degrees have been about equal for the past several years (Figure 6, no statistically significant difference since 2010). Women are more likely to be in this category than the lowest or highest educational categories, and women in this category are less likely to be participating in the labor force compared to other degree holders (Table 6). Women with children under 5 in the home are more likely to be in this category compared to women with no college degree.

Figure 6. Percent of Utah Adults 25+ Holding Only a Bachelor's Degree

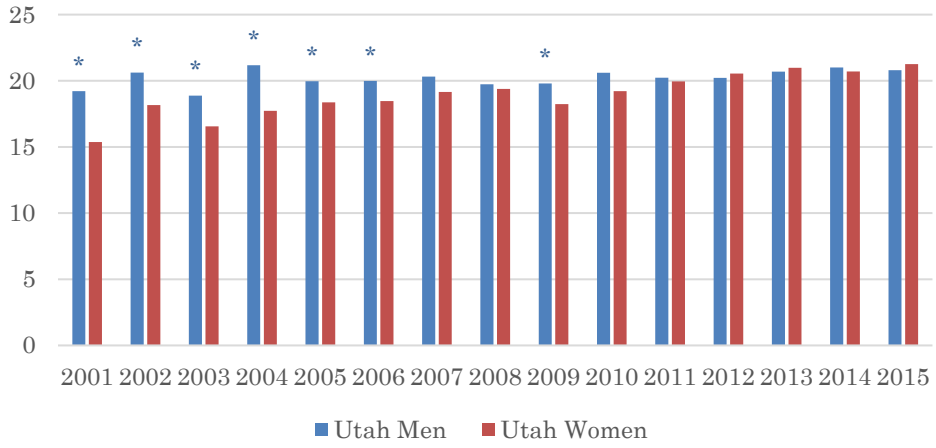


Table 6. Characteristics Associated with the Likelihood of Utah Adults 25+ Having a Bachelor's Degree, 2011-2014

	Compared to Some College, No Degree	Compared to Associate Degree Holders	Compared to Graduate Degree Holders
Female (vs male)	More likely	No difference	More likely
Hispanic origin (vs no Hispanic origin)	Less likely	Less likely	More likely
Labor force participation	More likely	More likely for men, less likely for women	Less likely, especially for women
Born out of Utah (vs born in Utah)	More likely	More likely	Less likely
In poverty (vs not in poverty)	Less likely	Less likely	More likely
Married (vs never married)	More likely for men, less likely for women	Less likely	Less likely for men, more likely for women
Divorced, separated, or widowed (vs never married)	Less likely, especially for women	Less likely, especially for women	No difference
Children under 5 in home (vs no children under 5 in home)	More likely, especially for women	More likely	Less likely

Graduate Degree

It is clear through our research that the area in which Utah men are surpassing Utah women is in graduate degree attainment. Utah women's graduate degree attainment is increasing over time, but Utah men's is as well so the gap remains (Figure 7). Utah men with a graduate degree are still only a small percentage of the overall population, but their attainment at the "bachelor's or above" level puts them above the rest of the nation in postsecondary educational attainment. This is true through all age groups, even though the likelihood of Utah women having a graduate degree increases slightly with age (Figure 8).

Figure 7. Percent of Utah Adults 25+ Holding Only a Graduate Degree

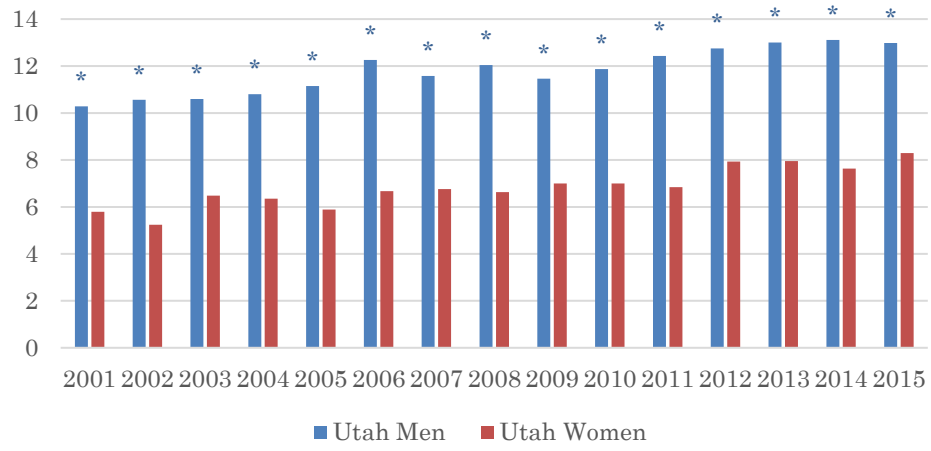
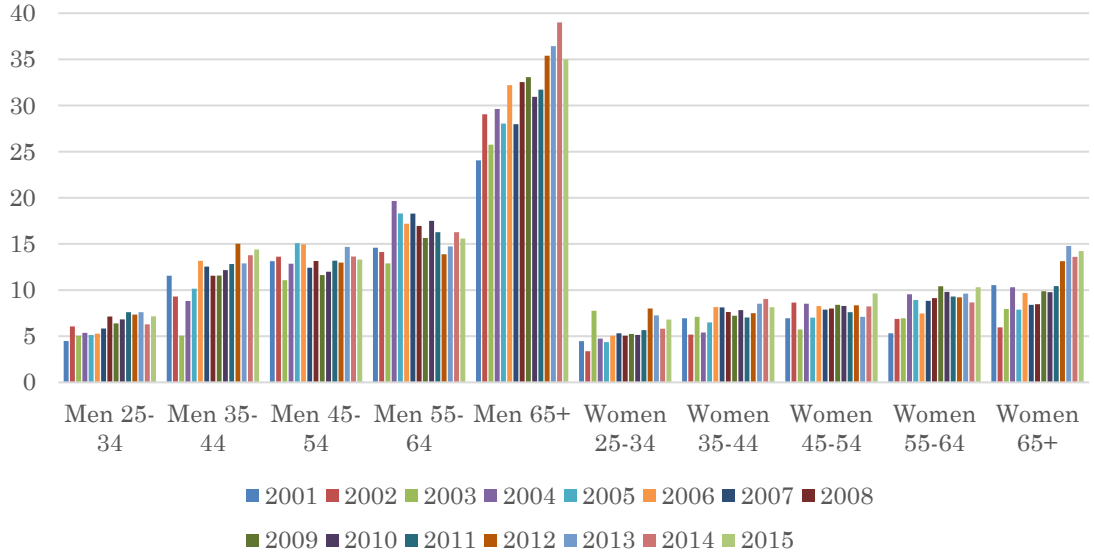


Figure 8. Percent of Utah Adults 25+ Holding a Graduate Degree



Women who do have a graduate degree are more likely to be participating in the labor force (Table 7). They (along with men) are more likely to have been born outside of Utah, and they are less likely to be in poverty. Utah women with graduate degrees are less likely to be married compared to women with associate and bachelor's degrees, and they are less likely to be divorced compared to women with an associate degree or less.

Table 7. Characteristics Associated with the Likelihood of Utah Adults 25+ Having a Graduate Degree, 2011-2014

	Compared to Some College, No Degree	**Compared to Associate Degree Holders**	**Compared to Bachelor's Degree Holders**
Female (vs male)	No difference	Less likely	Less likely
Hispanic origin (vs no Hispanic origin)	Less likely	Less likely	Less likely
Labor force participation	More likely, especially for women	More likely, especially for women	More likely, especially for women
Born out of Utah (vs born in Utah)	More likely	More likely	More likely
In poverty (vs not in poverty)	Less likely	Less likely	Less likely
Married (vs never married)	More likely, especially for men	Less likely only for women	More likely for men, less likely for women
Divorced, separated, or widowed (vs never married)	Less likely, especially for women	Less likely, especially for women	No difference
Children under 5 in home (vs no children under 5 in home)	More likely	More likely	More likely

Conclusion

Measuring postsecondary educational enrollment and attainment can be complicated. We use the ACS in this report to better understand Utah as a whole, and to see how general demographic characteristics and family formation behaviors are associated with educational activities for Utah men and women. We have been able to show that some patterns, such as women's associate degree attainment and men's graduate degree attainment, are fairly stable over time. We have also shown that other patterns, like men's and women's bachelor's degree attainment, have changed. It is good that the gap between men and women in bachelor's degree attainment has been eliminated, but there are still gender-based educational

disparities in Utah. These analyses also show that we may be close to reaching Utah's goal of 66% of adults holding a college degree; in 2015 41.9% of Utah men and 40.05% of Utah women held at least an associate degree (Table 5), and many more likely hold postsecondary certificates. However, since the ACS does not include data on certificates, we cannot measure certificate attainment here.

Despite the strengths of the ACS samples in this work, there are several weaknesses that can be addressed with additional datasets. First, the postsecondary educational enrollment and attainment categories in the ACS are somewhat general. We can only account for whether an individual is attending an undergraduate or graduate program, and there are no measures for technical or trade certificates. We also don't have information on the timing of life events and their relationship to educational attainment. We know that women who are married and men who are not married are less likely to obtain higher degrees, but we can't determine a temporal sequence for these associations. We also lack information in the ACS about the relationship between marriage and childbirth. There seems to be an effect of marriage that is independent of having young children, but surely women's educational attainment decisions are made while considering a constellation of events.

Section 2: Higher Education at a Comparative Level Using the Integrated Postsecondary Education Data System Surveys

The IPEDS data are comprised of several surveys conducted by the National Center for Education Statistics (NCES) under the direction of the United States Department of Education.[19] These surveys are administered three times per year to every postsecondary institution that participates in federal student financial aid to document enrollments, completions, graduations, financial aid, and institutional characteristics. IPEDS surveys are publicly accessible beginning with the 1980-81 cycle (though the most comprehensive views are available beginning with 1990). At the time of this report, final release data are available through 2015 and preliminary release data are available for some survey components through 2016. Most of our reported statistics cover the years 2000-2015.

Surveys can be accessed through the IPEDS online data tools at national, state, and institutional levels. For this report we used the IPEDS "Compare Institutions" and "Statistical Tables" functions to obtain survey data for Utah institutions, and the Digest of Education Statistics[20] tables for national-level statistics. All CSV files used in this report are available in the appendix. Most of the statistics reported here come directly from the summary files; however, we also used MNaven's python script[21] to transform raw data from the IPEDS repository into Stata files for additional analyses.

IPEDS institutions are classified by control (public or private, and sometimes also private (nonprofit) and private (for-profit)) and level (whether an institution offers less than 2-year, 2-year, or 4-year or higher programs). We anticipate that student populations vary across these institutional categories, and we present statistics for these institutions separately where possible.

Utah Postsecondary Institutions

Between 2000 and 2015, 79 degree-granting institutions in Utah submitted an IPEDS survey response. These institutions and their IPEDS classifications are listed in Table 8. The majority of these institutions (64%) are for-profit private institutions. About 15% are nonprofit private institutions, and about 21% are public institutions.

Table 8. Control of Utah Institutions

Public	Private Nonprofit	Private For-Profit	
Bridgerland Applied Technology College	Brigham Young University-Provo	Acaydia School of Aesthetics	Mandalyn Academy

Davis Applied Technology College	Independence University	American Beauty Academy	Medspa Academies
Dixie Applied Technology College	Latter-day Saints Business College	American Beauty Academy-Murray Campus	Myotherapy College of Utah
Dixie State University	Midwives College of Utah	AmeriTech College-Draper	Neumont University
Mountainland Applied Technology College	Stevens-Henager College (438151)	AmeriTech College-Provo	Nightingale College
Ogden-Weber Applied Technology College	Stevens-Henager College (230621)	Argosy University-Salt Lake City	Paul Mitchell the School-Logan
Salt Lake Community College	Stevens-Henager College (230630)	Avalon School of Cosmetology-Layton	Paul Mitchell the School-Ogden
Snow College	Stevens-Henager College (446677)	Aveda Institute-Provo	Paul Mitchell the School-Provo
Southern Utah University	Stevens-Henager College (477950)	Beautiful You School of Nail Technology	Paul Mitchell the School-Salt Lake City
Southwest Applied Technology College	Western Governors University	Bonnie Joseph Academy of Cosmetology and Barbering	Provo College
Tooele Applied Technology College	Westminster College	Broadview Entertainment Arts University	Renaissance Academie
Uintah Basin Applied Technology College		Broadview University-Layton	Rocky Mountain University of Health Professions
University of Utah		Broadview University-Orem	Sherman Kendall Academy-Midvale
Utah State University		Broadview University-West Jordan	Sherman Kendall Academy-Salt Lake City
Utah Valley University		Cameo College of Essential Beauty	Skin Science Institute
Weber State University		Careers Unlimited	Skinworks School of Advanced Skincare
		Eagle Gate College-Layton	Taylor Andrews Academy of Hair Design-West Jordan
		Eagle Gate College-Murray	Taylor Andrews Academy-Orem

	Evans Hairstyling College-Cedar City	Taylor Andrews Academy-St George
	Evans Hairstyling College-St George	The Art Institute of Salt Lake City
	Fortis College-Salt Lake City	The Barber School
	Francois D College of Hair Skin and Nails	Top Nails & Hair Beauty School
	Hairitage Hair Academy	University of Phoenix-Utah
	Healing Mountain Massage School	Utah College of Massage Therapy-Salt Lake City
	Ibero American College	Utah College of Massage Therapy-Utah Valley
	ITT Technical Institute-Murray	

These institutions are further categorized by the highest level of education offered in Table 9 (institutions are also highlighted according to control). Most of these institutions (44%) offer a one-year certificate or less. About 15% of institutions offer an associate degree or two-year certificate, 20% of institutions offer a bachelor's degree, about 15% of institutions offer a master's degree, and only five institutions (about 6.5%) offer a doctoral degree.

Table 9. Control of and Highest Award Levels Offered By Utah Institutions in 2016

Doctoral Degree		
Argosy University – Salt Lake City	University of Utah	Rocky Mountain University of Health Professions
Brigham Young University – Provo	Utah State University	
Master's Degree		
Broadview University	Southern Utah University	Weber State University
Independence University	Stevens-Henager College (438151)	Western Governors University
Midwives College of Utah	University of Phoenix – Utah	Westminster College
Neumont University	Utah Valley University	
Bachelor's Degree		
AmeriTech College – Draper	Dixie State University	Snow College
The Art Institute of Salt Lake City	Eagle Gate College – Draper	Stevens-Henager College (230621)

Broadview Entertainment Arts University	Eagle Gate College – Layton	Stevens-Henager College (230630)
	Eagle Gate College – Murray	Stevens-Henager College (446677)
Broadview University – Orem	Nightingale College	Stevens-Henager College (477950)
Careers Unlimited	Provo College	
Associate Degree or Two-Year Certificate		
Bridgerland Applied Technology College	Fortis College – Salt Lake City	Mountainland Applied Technology College
Davis Applied Technology College	Francois D. College of Hair Skin and Nails	Paul Mitchell the School – Logan
Evans Hairstyling College – Cedar City	Hairitage Hair Academy	Salt Lake Community College
Evans Hairstyling College – St. George	Latter-day Saints Business College	
One-Year Certificate		
American Beauty Academy-Murray Campus	Healing Mountain Massage School	Skin Science Institute
Acaydia School of Aesthetics	Mandalyn Academy	Skinworks School of Advanced Skincare
American Beauty Academy	Medspa Academies	Southwest Applied Technology College
AmeriTech College-Provo	Ogden-Weber Applied Technology College	Taylor Andrews Academy of Hair Design-West Jordan
Avalon School of Cosmetology-Layton	Paul Mitchell the School-Ogden	Taylor Andrews Academy-Orem
Aveda Institute-Provo	Paul Mitchell the School-Provo	Taylor Andrews Academy-St George
The Barber School	Paul Mitchell the School-SLC	Tooele Applied Technology College
Bonnie Joseph Academy of Cosmetology and Barbering	Renaissance Academie	Top Nails & Hair Beauty School
Cameo College of Essential Beauty	Sherman Kendall Academy-Midvale	Uintah Basin Applied Technology College
Dixie Applied Technology College	Sherman Kendall Academy-SLC	Utah College of Massage Therapy-SLC
Less Than One-Year Certificate		
Ibero American College	Myotherapy College of Utah	Utah College of Massage Therapy – Utah Valley
Rose = Public	Blue = Private Nonprofit	Orange = Private For-Profit

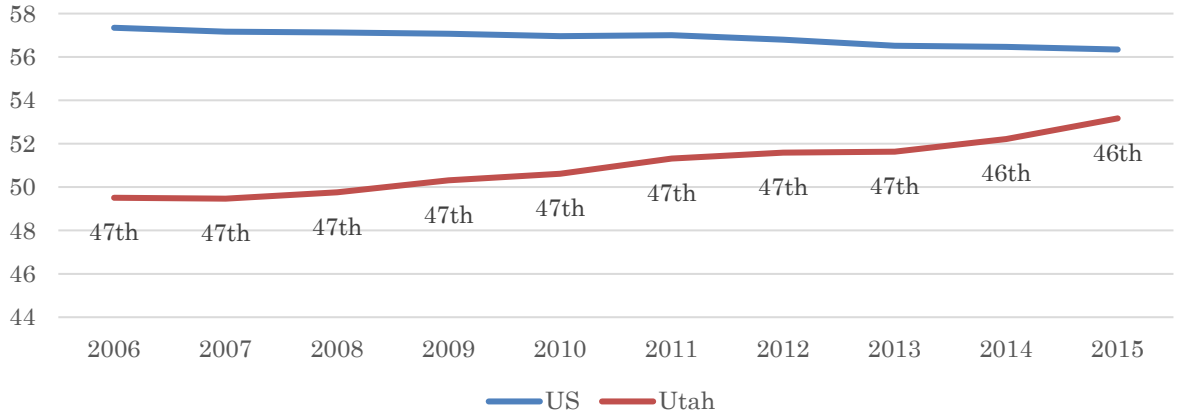
Enrollment

We also examined the fall enrollment statistics for Utah and US institutions between 2000-2015. Because IPEDS surveys are completed at an institutional level, all enrollment percentages in this section are referring to enrolled students only;

they do not indicate what proportion of the *population* is enrolled. That is, the "percent of female students" refers to the percent of the students who are female. This is in contrast to enrollment percentages that come from a population survey such as the American Community Survey (in the previous section), where enrollment percentages do represent the proportion of a population enrolled in postsecondary institutions. These data also do not account for demographic changes (such as in-migration or a shifting sex ratio) that likely influence who attends a postsecondary institution.

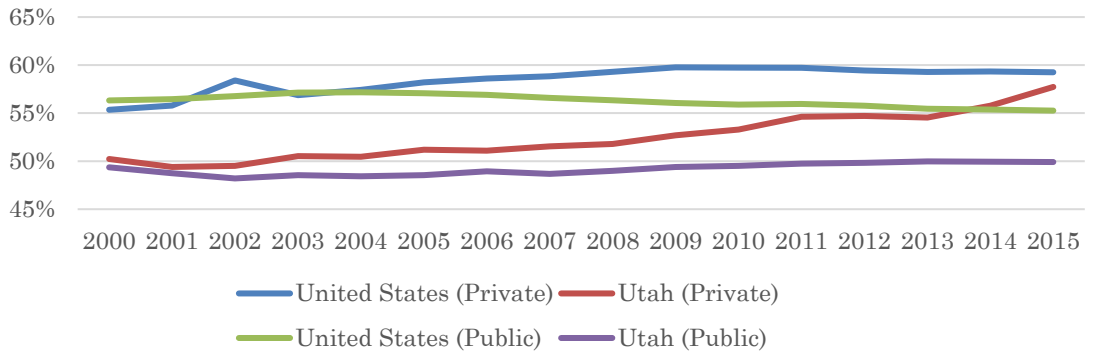
Compared to enrolled students nationally and in other states, women make up a smaller percentage of students enrolled in the fall each year between 2006-2015 (Figure 9). Though Utah women represent a greater proportion of enrolled students compared to men, and women are increasing their representation each year, Utah still ranks toward the bottom in terms of female representation in postsecondary degree-granting institutions because the national percent of fall female enrollment is higher.

Figure 9. Percent of Fall Female Enrollment in Degree-Granting Postsecondary Institutions



The percent of female enrollees in postsecondary degree-granting institutions has changed over time in Utah. These percentages also vary by control of institution (public and private).[22] Between 2000 and 2013, the percent of female students in Utah public and private institutions was lower than that of US institutions (Figure 10). In 2014, the percent of female students at Utah private institutions surpassed the percent nationally, while the percent of female students at Utah public institutions remained relatively stable (and lower than the percent nationally).

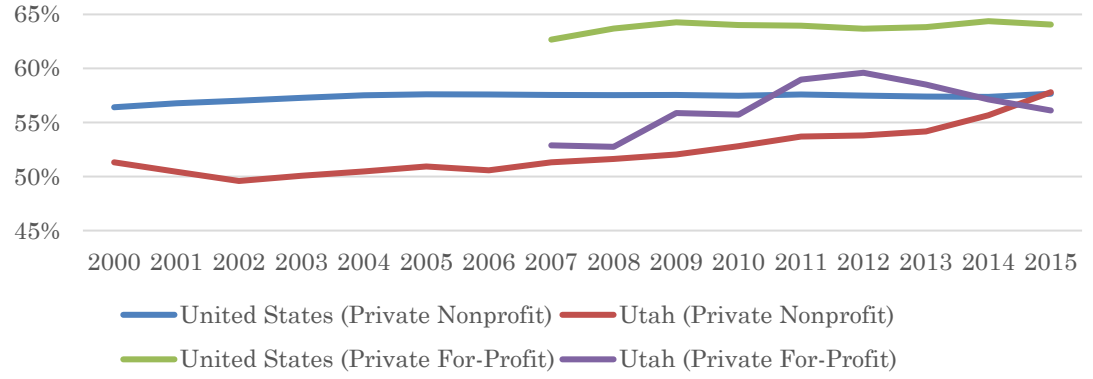
Figure 10. Percent Female Enrollment in Utah and US Public and Private Degree-Granting Institutions



Institutional Control

We see a similar pattern when we compare the percent of enrollees in for-profit and nonprofit private institutions. While the female percentages in United States private for-profit institutions are the highest, percentages in Utah private for-profit institutions approached the US line in 2012 before declining to cross with the percent of female enrollees in Utah private nonprofit institutions in 2015 (Figure 11).

Figure 11. Percent Female Enrollment in Utah and US Private Degree-Granting Institutions



Women's representation also varies across specific Utah postsecondary institutions. As expected, each of the institutions in the "private for-profit" group enroll a high percentage of women.

Age

Although the IPEDS data are at an institutional level, we can use reports of fall enrollment by age to better understand Utah's unique postsecondary age structure.[23] The following two figures show the female percentage of each age group

(from under 18 to 65 and older) for Utah (Figure 12) and US (Figure 13) postsecondary degree-granting institutions. There is much more variation in the percentage of each age group that is female in Utah, and we see patterns that might be expected in a culture where religious mission service is encouraged for many young men and where early childbearing is encouraged for many young women. The age groups with the highest percentage of female enrollment are 18-19, 20-21, 40-49, and 50-64. The age groups with the highest percentage of male enrollment are 22-24 and 25-29 (post-mission years for many men and prime childbearing years for many women). The age group trends for US institutions are more tightly clustered, and all age groups include a percentage of women greater than 50%. Conversely, for several age groups in Utah women remain a minority of enrollees (though the percentage of women enrolled through the 20s is increasing over time).

Figure 12. Percent of Female Enrollment by Age Group in Utah Degree-Granting Institutions

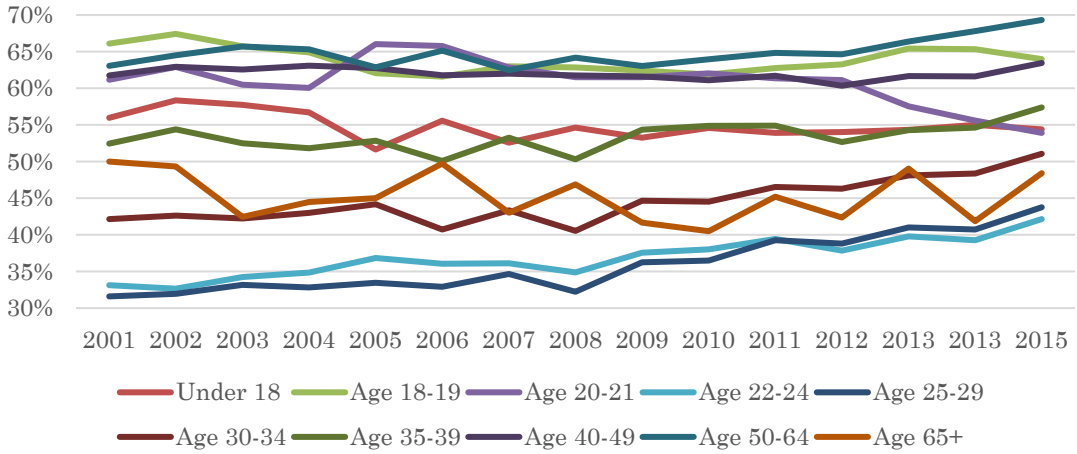
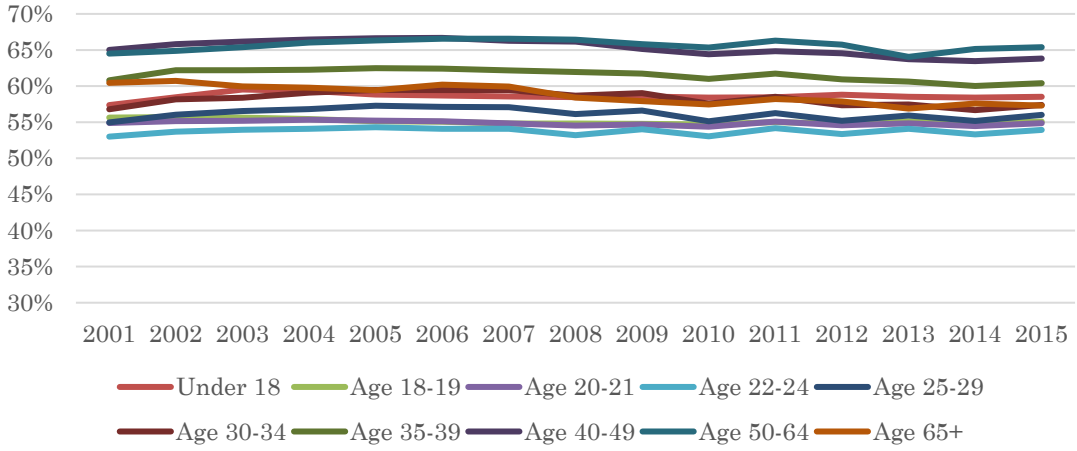


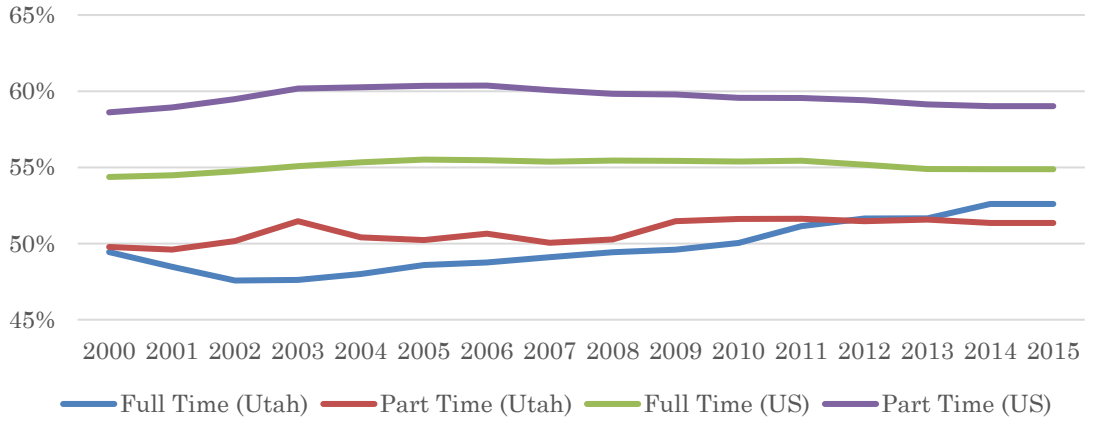
Figure 13. Percent of Female Enrollment by Age in US Degree-Granting Institutions



Attendance Status

In a culture where many young people are encouraged to begin family formation before finishing their postsecondary educational activities, we may expect to see these competing demands for men's and women's time reflected in unique attendance patterns. Interestingly, the female percentages of full- and part-time enrollment are more similar in Utah than in the US. For both attendance groups women represent about half of enrollees, with a slightly lower percentage of full-time students until about 2012. In the US, women represent about 55% of full-time and 60% of part-time enrollees. These differences could reflect different expectations about the timing of women's educational attainment versus other activities or norms about educational attainment that are slow to change.

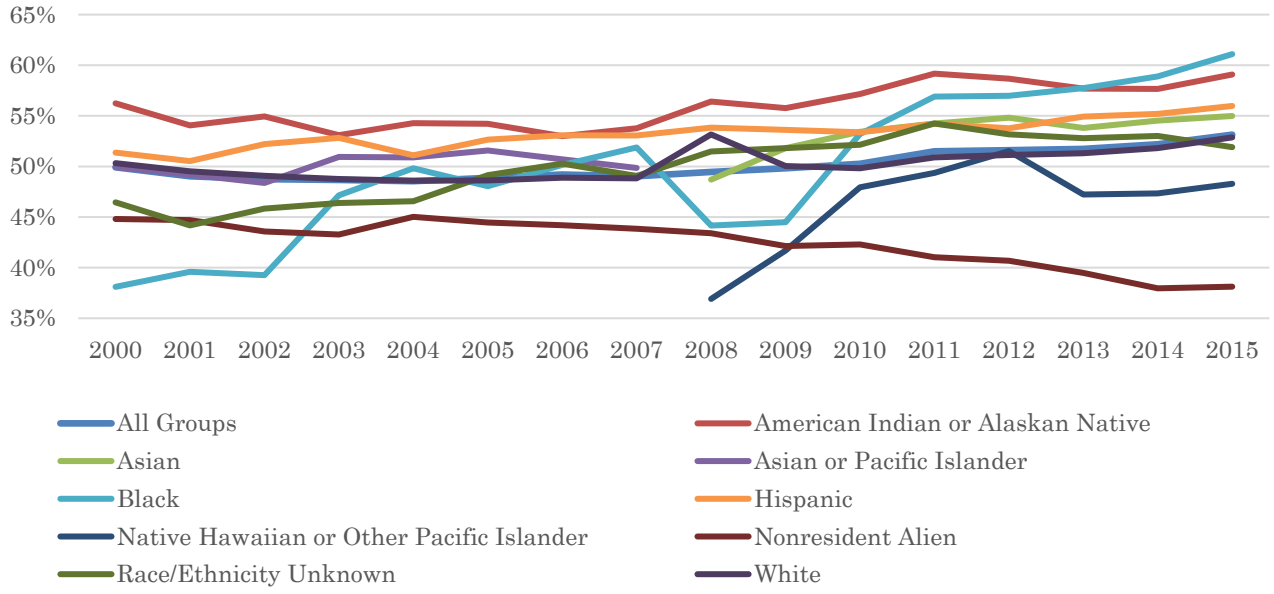
Figure 14. Percent of Female Enrollment by Attendance Status for Utah and US Degree-Granting Institutions



Race and Ethnicity

Female enrollment in Utah across most racial/ethnicity groups has increased over time. This is evident despite changes in how race is measured in the IPEDS surveys;[24] beginning in 2008, students could report more than one race/ethnicity, and the Asian, Pacific Islander, black, and white race/ethnicity categories were revised (2008 and 2009 percentages should be interpreted with caution).[25] Additionally, the number of institutions who reported on race/ethnicity varies from year to year (likely influencing the year-to-year fluctuation in the percentages). Across these changes the percent of female enrollees in each group increased with the exception of the nonresident alien category (Figure 15).

Figure 15. Percent Female Fall Enrollment in Utah by Race/Ethnicity for Degree-Granting Postsecondary Institutions



The percentages of female enrollment by race/ethnicity group in the US are considerably more stable, but some of the patterns are similar to those found in Utah. The percent of female enrollment among those classified as "nonresident alien" is the lowest in both Utah and the US, and in both sets of institutions the "American Indian or Alaskan Native" group is among the highest. However, patterns differ for other race/ethnicity groups (Figure 16).

Figure 16. Percent Female Fall Enrollment in the US by Race/Ethnicity for Degree-Granting Postsecondary Institutions

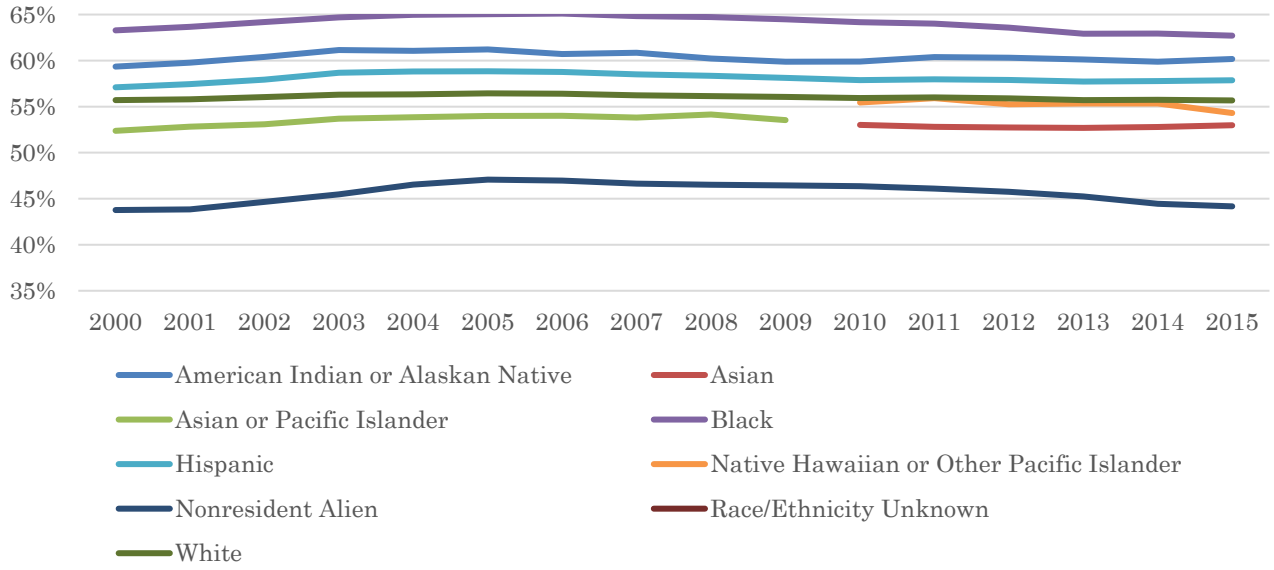


Table 10 lists the differences between Utah and US percentages for each group and year. In this table a higher number indicates that the percent of female enrollees in that race/ethnicity group is higher in the US compared to Utah. The differences between the US and Utah are decreasing over time for all women ("All Groups" in the table) and for the American Indian or Alaskan Native, black, Hispanic, and white race/ethnicity groups. Differences are increasing for Asian and nonresident alien groups, with a higher female enrollment among Asians in Utah.

Table 10. Difference Between US and Utah Percent Female (US – Utah) Fall Enrollment by Race/Ethnicity and Year for Degree-Granting Postsecondary Institutions

	All Groups	American Indian or Alaskan Native	Asian	Asian or Pacific Islander	Black	Hispanic	Native Hawaiian or Other Pacific Islander	Nonresident Alien	White
2000	6.2%	3.1%		2.4%	25.2%	5.7%		-1.0%	5.4%
2001	7.3%	5.7%		3.6%	24.1%	6.9%		-0.9%	6.3%
2002	7.9%	5.5%		4.7%	24.9%	5.7%		1.1%	7.0%
2003	8.4%	8.1%		2.7%	17.5%	5.9%		2.2%	7.5%
2004	8.7%	6.8%		3.0%	15.1%	7.7%		1.5%	7.7%
2005	8.5%	7.0%		2.4%	17.0%	6.2%		2.6%	7.8%
2006	8.1%	3.1%		3.3%	14.9%	5.7%		2.8%	7.5%
2007	8.1%	3.1%		4.0%	13.0%	5.4%		2.8%	7.4%
2008									
2009									
2010	6.7%	2.7%	-0.4%		11.0%	4.5%	7.5%	4.1%	6.1%
2011	5.5%	1.2%	-1.4%		7.1%	3.8%	6.6%	5.1%	5.1%
2012	5.2%	1.6%	-2.1%		6.6%	4.1%	3.7%	5.1%	4.8%
2013	4.8%	2.4%	-1.1%		5.2%	2.8%	8.1%	5.8%	4.4%
2014	4.3%	2.2%	-1.7%		4.0%	2.6%	8.0%	6.5%	3.9%
2015	3.2%	1.1%	-2.0%		1.6%	1.9%	6.0%	6.0%	2.8%

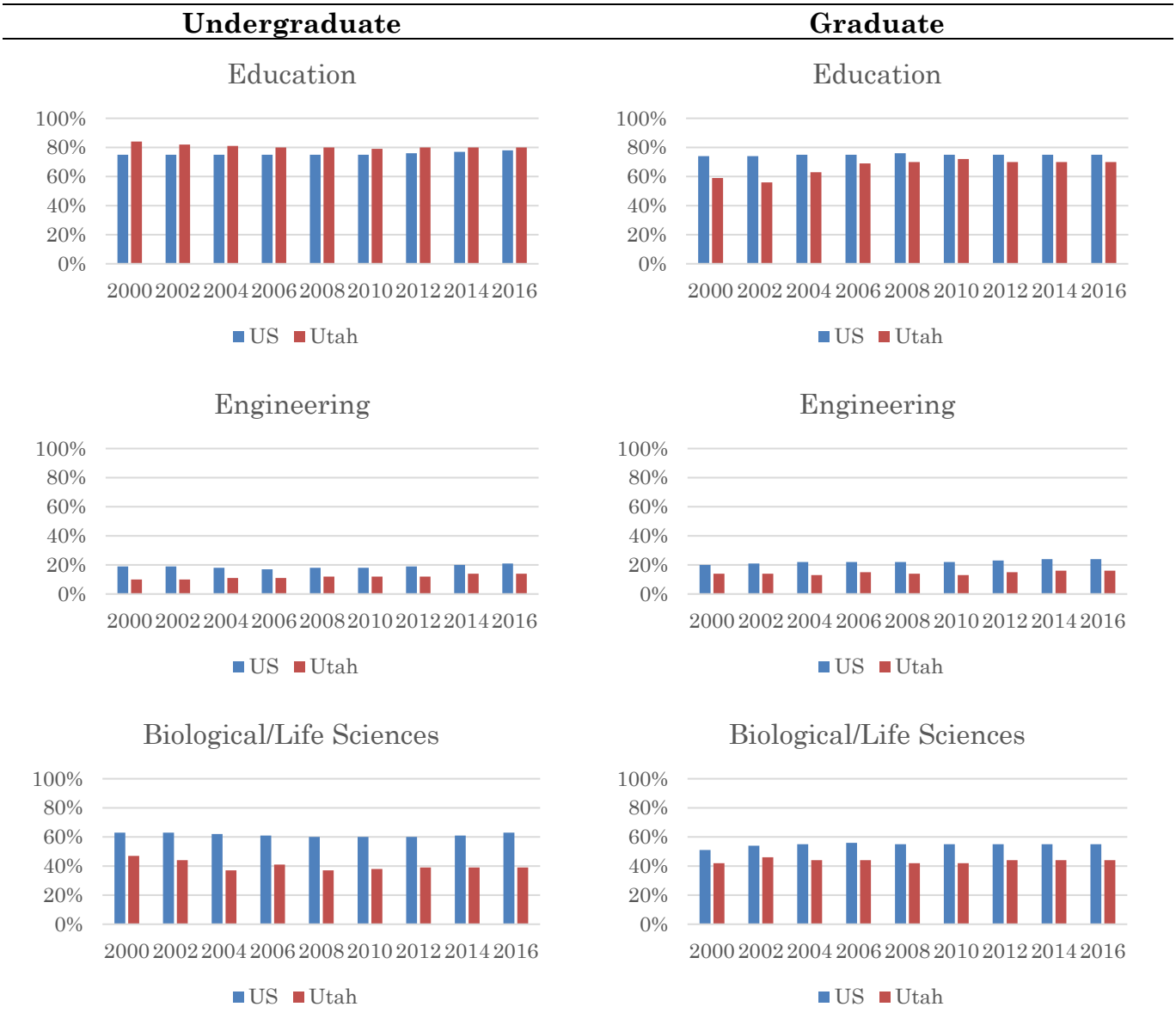
Years 2008 and 2009 omitted because of missing responses from Utah and US institutions.

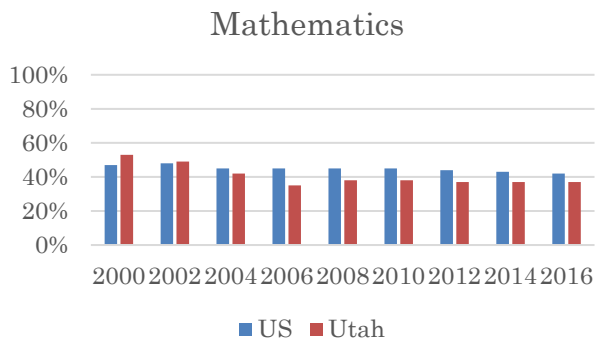
Field of Study

Our final comparison between enrollment in Utah and US institutions concerns student field of study. These data are available every other year for several broad subject areas: education, engineering, biological/life sciences, mathematics, physical science, business management/administration, law, and medicine. The following charts (Figure 17) show the percent female undergraduate and graduate enrollment in each of these subject areas, and graduate enrollment in law and medicine. The number of institutions represented in the Utah data varies depending on the classification of the field of study (for example, there has only been one institution

in Utah offering a graduate medical degree, but there are up to 25 institutions offering a business-related undergraduate degree).

Figure 17. Enrollment by Field of Study




Mathematics
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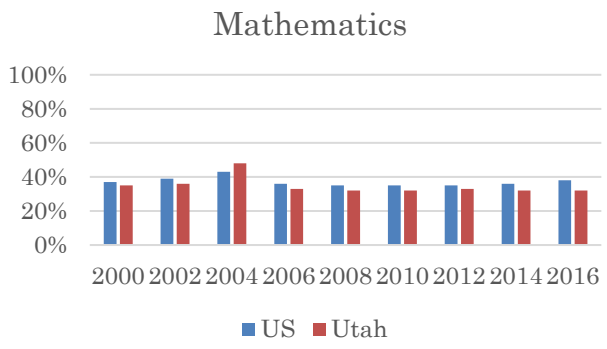
80%
60%
40%
20%
0%
2000 2002 2004 2006 2008 2010 2012 2014 2016
US
Utah


Mathematics
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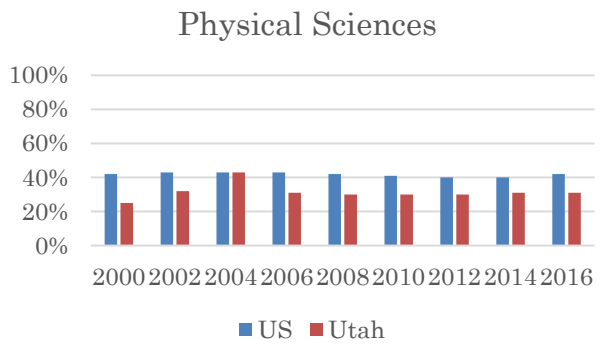
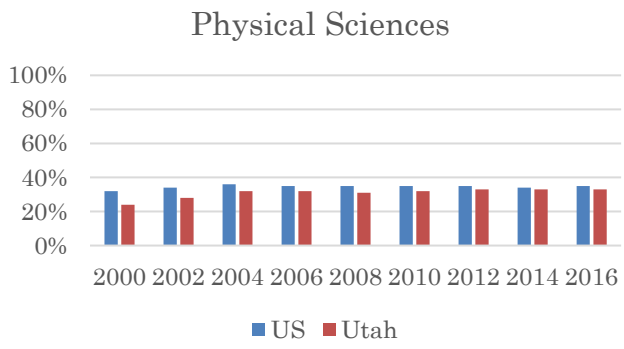
Utah


Physical Sciences
100%
80%
60%
40%
20%
0%
2000 2002 2004 2006 2008 2010 2012 2014 2016
US
Utah


Physical Sciences
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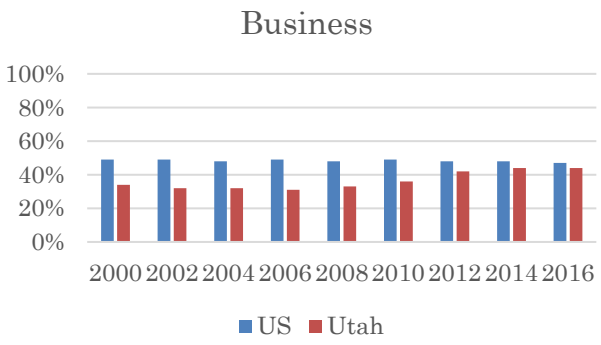
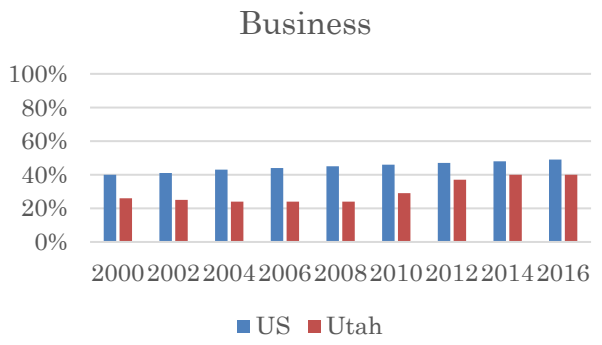

Business
100%
80%
60%
40%
20%
0%
2000 2002 2004 2006 2008 2010 2012 2014 2016
US
Utah


Business
100%
80%
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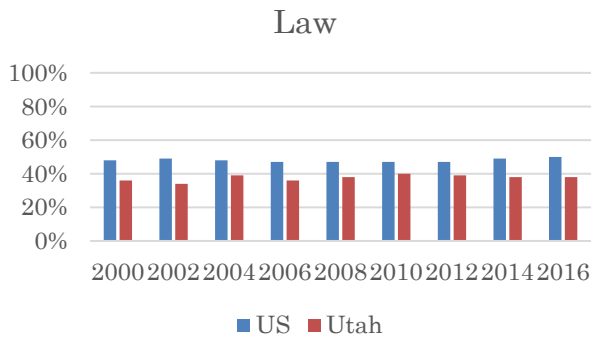
2000 2002 2004 2006 2008 2010 2012 2014 2016
US
Utah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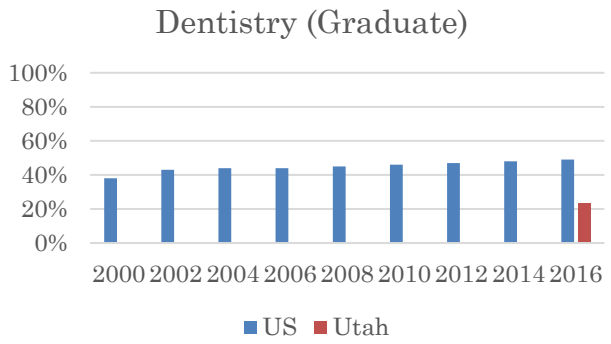
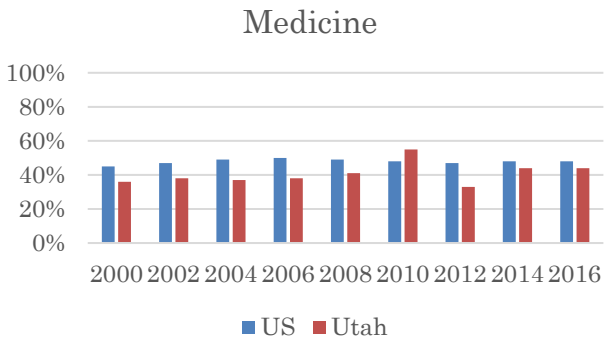




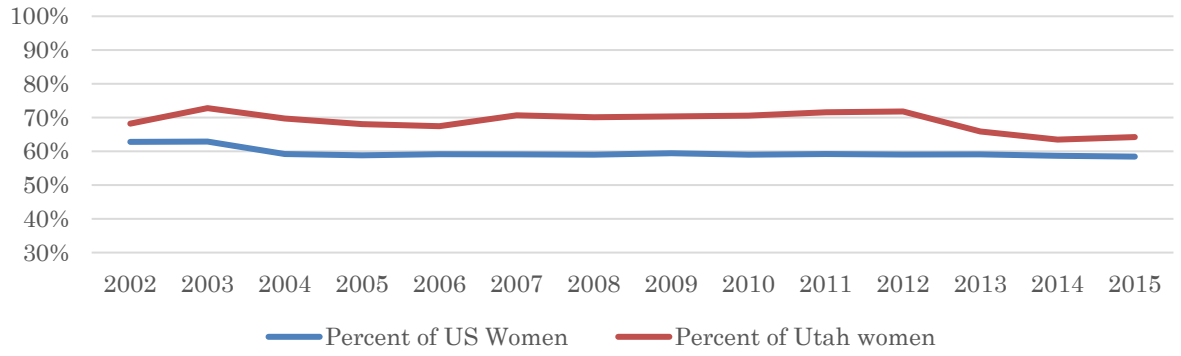
In the US and in Utah, women represent the majority of education undergraduate and graduate students. However, the percent of Utah women in undergraduate education programs exceeds that of US women (though these differences are narrowing), and the reverse is true for graduate education programs. The percent of Utah women in mathematics undergraduate programs exceeded that of US women in 2000 and 2002, but since then the percent of US women in these programs has been higher than that of Utah women. In all other undergraduate majors, the percent of women enrollees is higher for US women. With the exception of mathematics in 2004 and medicine in 2010, the percent of women in graduate programs is higher for US women (but Utah and US women are nearly equal in their percent enrollment in physical science graduate programs in 2014 and 2016). All women (US and Utah) represent a lower percentage of engineering and physical science programs compared to other majors. These differences depict the concentration of women in stereotypically female majors. The lower representation of Utah women in graduate programs may reflect cultural proscriptions against career investment among women, or it could be that women don't see a way to prioritize graduate education in the face of other competing demands.

Completion

IPEDS surveys provide only a limited snapshot of the graduation and completion landscape; institutions report completions within a normal amount of time and within 150% of normal time for each degree or certificate level, but completions after 150% of normal time are generally not included in institution statistics. Previous research on Utah postsecondary education completions suggests that Utah men and women may be more likely to finish outside of normal or 150% of normal time because of LDS mission service, early family formation, or other factors.[26] Before we examine the Utah and US comparisons in completion and graduation, we emphasize that the following tables exclude students who stopped out and later completed their certificate or degree. Thus, using a measure such as "percent female" introduces bias to the extent that stopping out is more likely for men or women in Utah.[27]

Across all program lengths, Utah women represent a higher percentage of completers within 150% of normal time compared to US women (Figure 18). We can see a possible impact of the change in LDS mission age in the drop-off that begins in the year 2012.

Figure 18. Completers Within 150% of Normal Time



Utah women represent an even higher percentage of students who complete a less-than-two-year program in 150% of normal time (Figure 19). The national percentage of these completers who are female is similar to the overall percentage shown in Figure 18, but in Utah women have made up between about 70-80% of this group in most years. Utah women exhibit a similar pattern for programs between two and four years (Figure 20).

Figure 19. Completers of Programs Less than 2 Years in 150% of Normal Time

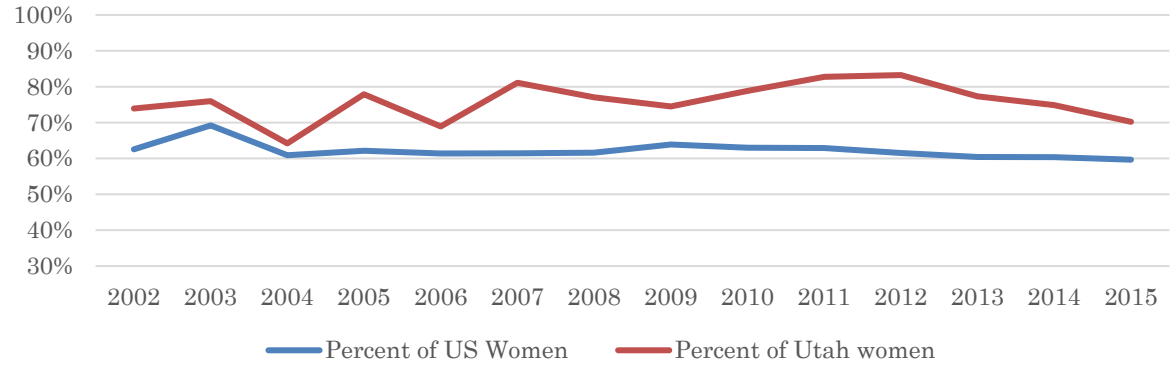
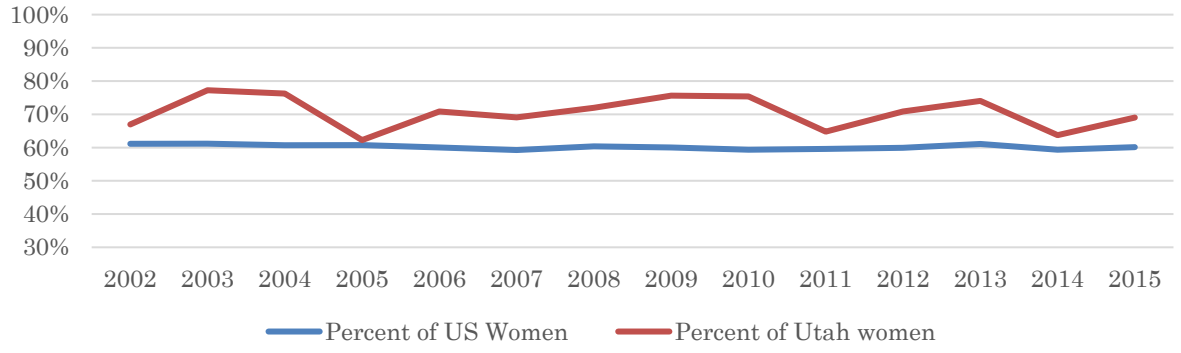


Figure 20. Completers of Programs Between 2 and 4 Years in 150% of Normal Time



We see a changing trend when we shift our focus to completion of bachelor's or equivalent degrees. The percentage of these degrees completed within 150% of normal time by Utah women is closer to that of the US, and the composition of this group may be becoming more equal in Utah over time (Figure 21). The lower percentage of women indicates that a greater proportion of these degrees compared to lower degrees is going to men. This is what we would expect given women's higher enrollment in institutions offering 2- and 2-4 year programs (i.e., private for-profit institutions). Figures 21-23 provide more detail on these trends, illustrating the percent female of completers of bachelor's or equivalent degrees in 4, 5, or 6 years or less.

Figure 21. Completers of Bachelor's or Equivalent Degrees in 4 Years or Less

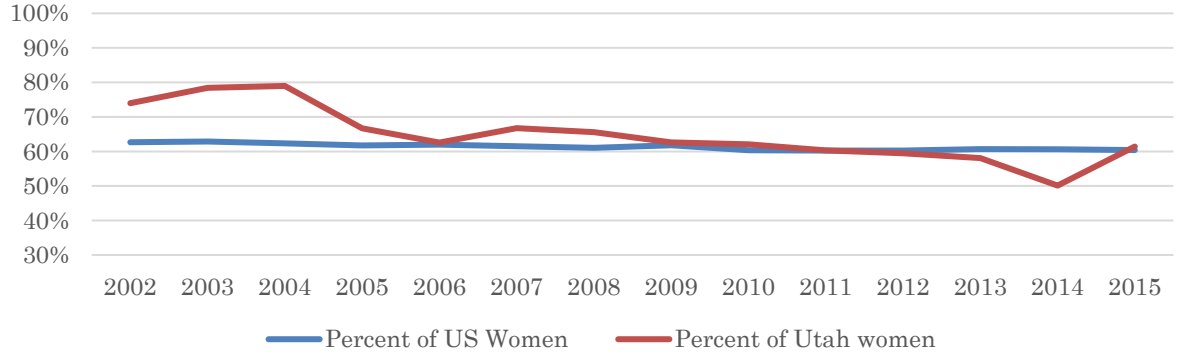


Figure 22. Completers of Bachelor's or Equivalent Degrees in 5 Years or Less

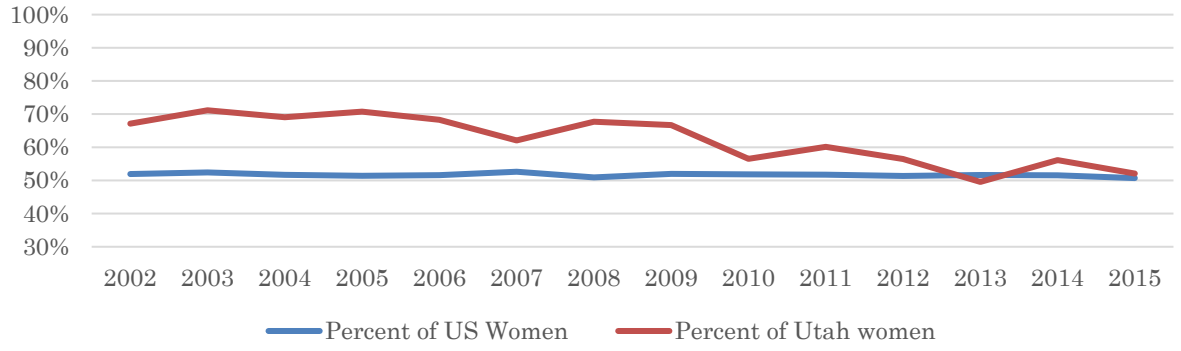
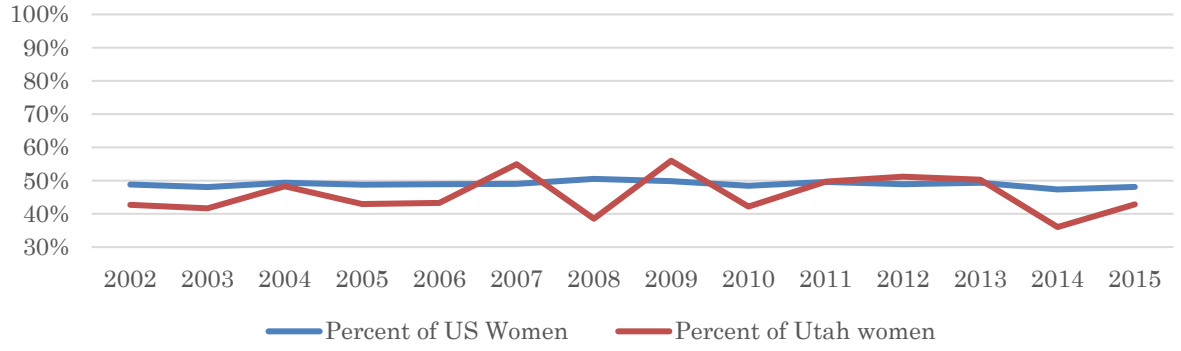


Figure 23. Completers of Bachelor's or Equivalent Degrees in 6 Years or Less



In Figures 22 and 23 we see that, in the US, men and women are nearly equal among completers of bachelor's or equivalent degrees within 5 and 6 years. Conversely, Utah women are less represented among completers as the time to finish increases. It could be more normative (and culturally acceptable) for Utah men to take longer to complete a bachelor's degree (reflecting their overrepresentation among those completing in 6 years or less), but this doesn't explain why they are gradually earning more (relative to women) of the bachelor's degrees awarded within 4 and 5 years (Figures 21 and 22). A more compelling argument would consider Utah's changing demographics toward becoming less homogenous and more reflective of the rest of the US[28] in conjunction with increased LDS mission participation among young Mormon women.

Conclusion

According to IPEDS data in this report, Utah women are highly engaged in postsecondary educational activities. They represent a larger proportion (compared to men) of enrolled students at private nonprofit and for-profit institutions. They are overrepresented among students who are 18-19, 20-21, 40-49, and 50-64. They

represent about half of full-time and about 60% of part-time enrollees, and in many cases, they complete a larger proportion of degrees compared to men. However, postsecondary educational attainment in Utah is not a contest between men and women. As emphasized throughout this report, we support Utah's goal of 66% of Utah men *and* women holding a postsecondary degree or certificate by 2020. While our focus is on women, we are most concerned about how women in Utah are faring compared to women nationally. Utah is near the bottom of all states in fall female enrollment, and Utah women's postsecondary educational attainment is still gendered by program length and field of study (both of which are linked to less favorable economic outcomes).[29]

The IPEDS data are well suited for these comparisons given their standardized surveys and data availability over time. But we also recognize their inherent limitations. IPEDS data are useful when classifying institutions and making national comparisons, but they are not directly comparable to research from other sources for two main reasons. First, IPEDS data are limited to students attending degree-granting institutions who submit IPEDS surveys. Different schools are included in each survey, and aggregate results may change depending on a state's (or country's) institutional constellation. For example, the rise and fall of for-profit institutions affect who is enrolled and which institutions submit reports in a given year. Second, at an individual level the IPEDS data are cross-sectional and cohort-specific. We cannot follow a student or group of students over time except for within certain bounds (like students completing within a particular amount of time), so we cannot know whether change over time is due to changes in behavior, changes in the student population, or some other cause. Future research should incorporate additional data sources that can help answer these questions.

Section 3: Higher Education at an Individual Level Using the Utah System of Higher Education Data

This section covers postsecondary educational activities between 2000-2017 at the eight public colleges and universities in Utah. We obtained access to individual- and institutional-level data, housed in Microsoft SQL Server at USHE headquarters, through the assistance of Dr. Joseph Curtin and Dr. Kimberly Henrie and according to an agreement between the Women in the Economy Commission and the Utah State Board of Regents. In order to protect student privacy we do not include individual-level or personally-identifying information in this report, and data used to produce this report are not available outside of USHE offices.

We begin by describing educational activities at USHE institutions for beginning and continuing postsecondary students. In the USHE Institutions section of this report we show demographic and educational differences across and within institutions over time, paying special attention to changes in educational participation and outcomes for men and women.

We also use these data to answer two broad questions. First, what is the life course of postsecondary students in Utah? At what age do Utah men and women enroll in postsecondary education, and at what age and level do they stop? How long do students stop for, and when (if ever) do they return? How is persistence associated with completion? Answers to these questions for students enrolled in USHE institutions are detailed in the Life Course section of this report.

Second, what fields of study do men and women pursue? Media attention has been given to women's unequal representation in STEM fields[30] and men's unequal representation in traditionally-female fields like education.[31] To what extent are these patterns found in USHE institutions? And are these areas of study equally associated with persistence and completion? We answer these questions in the Field of Study sections of this report.

Before we delve into our analyses we wish to emphasize that there are individual, institutional, and contextual factors that influence men's and women's postsecondary educational attainment in Utah. Individual students choose which schools to attend, when to pursue postsecondary education, and what to study. We recognize that students may act within "bounded rationality" (choosing among options they are *aware* of, rather than among *all possible* options),[32] and they may be subject to "gender blinders" (perceiving that some options are only available to or appropriate for members of a given gender).[33] But these constraints are invisible in our analyses and are hopefully becoming less salient over time (e.g., as high school counselors receive more training and resources to help inform students about postsecondary educational opportunities, or as it becomes more normative for both men and women to complete a postsecondary degree). At an institutional level,

factors such as course/major/degrees offerings, tuition, admissions standards, and marketing efforts may influence who attends and completes a degree. For example, as online and asynchronous course offerings increase, student diversity may increase.[34] Finally, contextual and cultural factors can influence postsecondary educational activities. These factors may include the change in the age requirements for LDS missions[35] or adjustments to federal student loan policy.[36] Almost all of these factors are beyond the scope of this report, but it is important to recognize that they exist and are likely influential in reciprocal and varying ways.

Data and Measures

We use the Students Data Submission File and the Graduation Data Submission File for years between 2000-2017 to answer questions about student enrollment, persistence, and completion. Data in both files are compatible with IPEDS surveys. The Students Data Submission File is submitted to USHE twice per fall/spring term (third week and end of term) and once per summer term (end of term). This file includes demographic and enrollment data for each student enrolled in a USHE institution, limited to the end-of-term submissions for each term. The Graduation Data Submission File is submitted to USHE in October of each year and includes all completions (degrees, certificates, and awards) with a conferral date between July 1 of the previous calendar year and June 30 of the current calendar year (following the summer-to-summer academic year range of the student file). These files were queried on site in USHE offices via Microsoft SQL Server. Queries are included in the Appendix.

Institution-specific data in this report are aggregated to protect student privacy. For each institution we report summarized student registration status (first-time freshman, continuing student, etc.); gender; degree level; and field of study (by CIP code category). Percentages are omitted from a given table if the total number of students for that cell/percentage is less than 10.

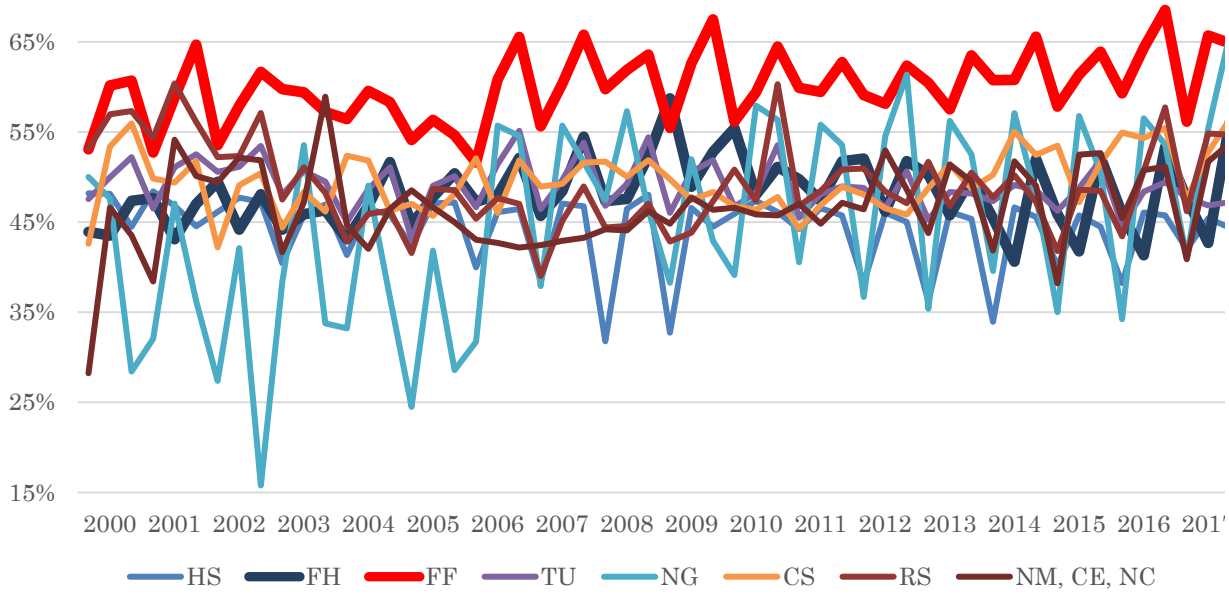
We also categorized institutions according to the highest level offered to further ensure student anonymity in our event-history analysis. These categories are PhD/Doctorate (The University of Utah and Utah State University); Master's (Southern Utah University, Utah Valley University from 2008 on, and Weber State University), Bachelor's (Dixie State University, Snow College from 2012 on, and Utah Valley University through 2007); and Associate's (Salt Lake Community College and Snow College through 2011). We omit Utah State University – Eastern (USUE) and Utah State University – Eastern (Department of Workforce Education) (USUE-DWE) from these categories because their offerings do not clearly map to these categories and have changed over time.

Approximately 1.5% of students in the student file were enrolled in multiple institutions in at least one term between 2000-2017. We included these students in all analyses so as to not underrepresent any given institution.

Beginning Postsecondary Students

Student registration status is classified into 13 categories depending on the student status at the beginning of the term. In general, students first appear in the Students Data Submission File either as a beginning/new student, a returning student whose first terms are before the first term of the file, and/or a transfer student from a non-USHE institution. Figure 24 shows the numbers of students in their first term (the first term the student appeared in the Students Data Submission File) and the percent female in each registration status category for all USHE institutions between 2000-2017. Registration status definitions are taken verbatim from the Students Data Submission File data dictionary. Transfer-in graduate students (TG), continuing graduate students (CG), and returning graduate students (RG) are omitted from this table because of small cell sizes.

Figure 24. Percent Female of First-Term* Enrollees by Registration Status at USHE Institutions



* First term the student appeared in the Students Data Submission File, not necessarily the student's first term in a postsecondary institution.

Legend:

HS (High school student): A student who is taking classes from the institution while still in high school.

FH (First time student – undergraduate): A student who is attending any institution for the first time at the undergraduate level *within 12 months* after graduation from high school.

FF (First time student – undergraduate): A student who is attending any institution for the first time at the undergraduate level *not within 12 months* after graduation from high school.

TU (Transfer-in undergraduate student): A student entering the reporting institution for the first time but known to have previously attended a postsecondary institution at the same level (e.g., undergraduate, graduation).

NG (New graduate student): A student who holds a bachelor's or first-professional degree, or equivalent, and is taking courses at the post-baccalaureate level for the first time.

TG (Transfer-in graduate student): A student entering the reporting institution at the graduate level for the first time but known to have previously attended another postsecondary institution at the graduate level.

CG (Continuing grad): A graduate student who is re-enrolling at the institution after having attended a previous term as a grad student.

RG (Returning grad): A student who has re-enrolled at the institution after stopping out for at least one term of graduate coursework (excluding summer term). **Note: In this table, TG, CG, and RG students are omitted.**

CS (Continuing student): A student who is re-enrolling at the institution after having attended the previous term. Includes a student who attends spring term, stops out summer term, then returns fall term.

RS (Returning student): A student who has re-enrolled at the institution after stopping out for at least one term (excluding summer term).

NM (Non matriculated): A non matriculated student is one who is taking courses without applying for candidacy for a degree. **Note: In this table, CE and NC students are reported with NM students.**

CE (Continuing education non matriculated): An optional sub-category under non matriculated. A CE student is one who is taking courses to satisfy personal interests.

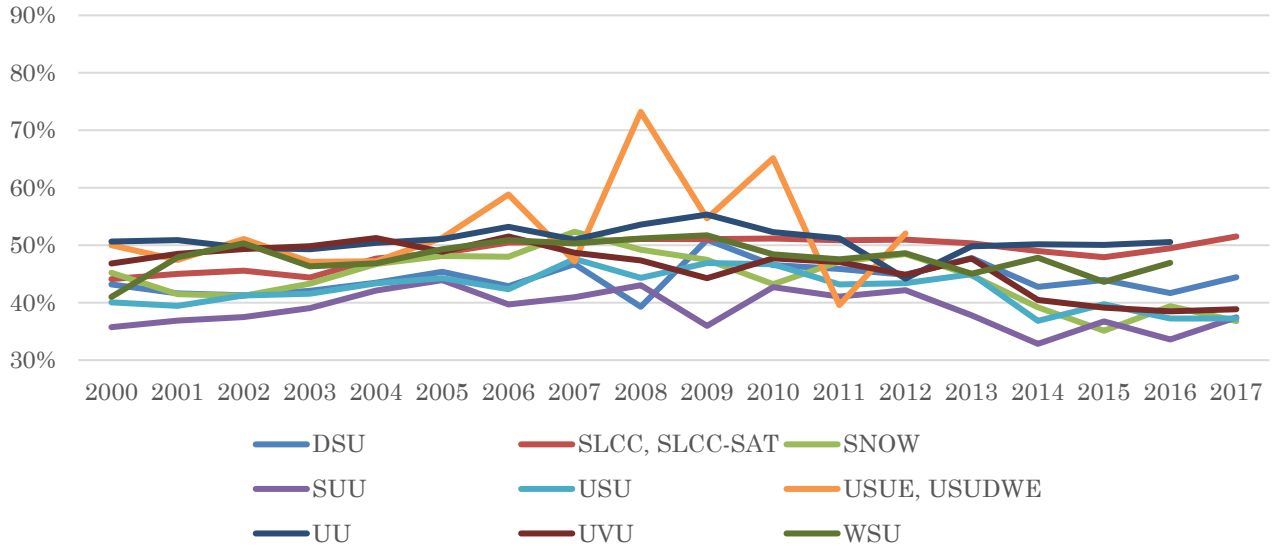
NC (Non credit non matriculated): An optional sub-category under non matriculated. Primarily for CTE programs of study.

In Figure 24 the lines for first-term freshman students (FH and FF) are bolded to increase visibility. Jaggedness in all lines is due to the term-level nature of these data; enrollment percentages tend to vary across summer, fall, and winter terms (all of which are reported here for each year). Among freshman students, a higher percentage of students enrolling for the first time **not** within 12 months after graduating from high school are female, and the percentage of female students in this group is gradually increasing over time. There is much more variability in the female percentage of students who **are** enrolling within 12 months after graduating from high school, especially beginning in 2014. For this group, the percent of female enrollment is highest in the third (spring) semester each year.

These patterns are more clear in Figures 25 through 28. Figure 25 shows the percent female student enrollment of students enrolling for the first time **within** 12 months of high school (FH) for each USHE institution. Percentages vary but generally cluster within 40-50%. Figure 26 shows that the number of students in

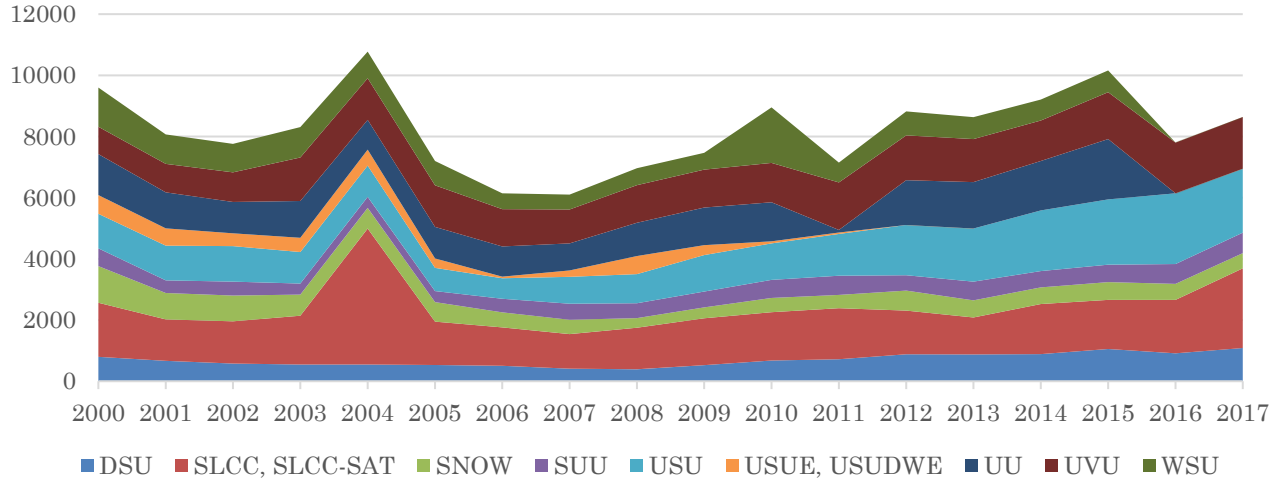
this registration category has been increasing over time among institutions reporting this number.

Figure 25. Percent Female of First-Term* First-Year Enrollees Within 12 Months of High School Graduation (FH)



* First term the student appeared in the Students Data Submission File, not necessarily the student's first term in a postsecondary institution.

Figure 26. Total Number of First-Term* First-Year Enrollees Within 12 Months of High School Graduation (FH)

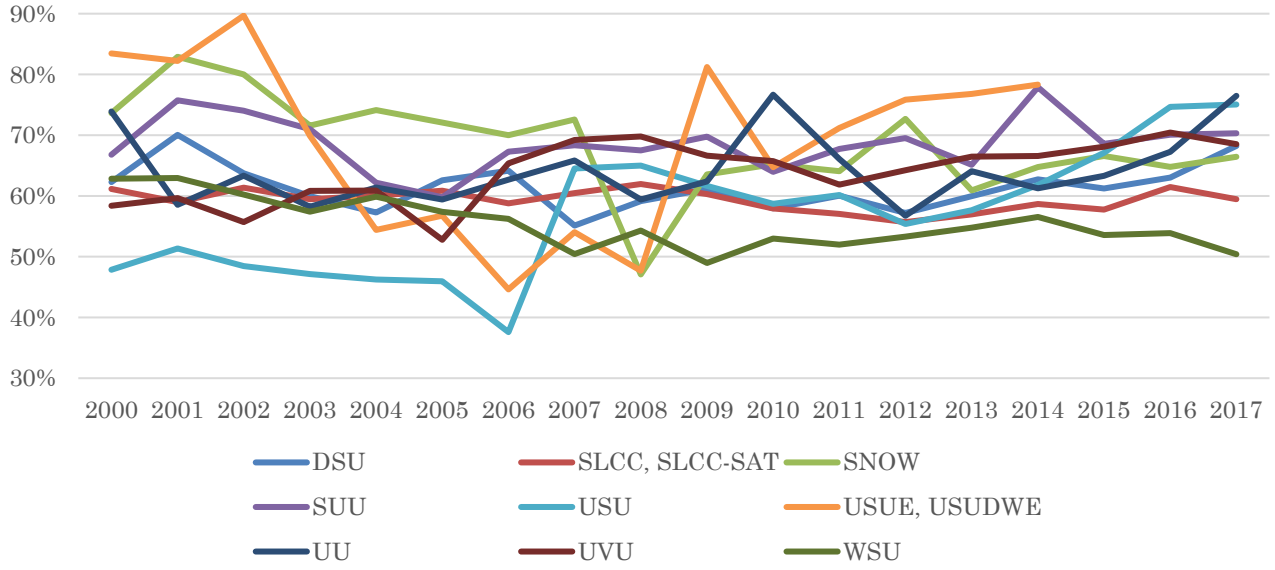


* First term the student appeared in the Students Data Submission File, not necessarily the student's first term in a postsecondary institution.

The percent female student enrollment of students enrolling for the first time **not within** 12 months of high school (FF) is higher, ranging from between about 50-

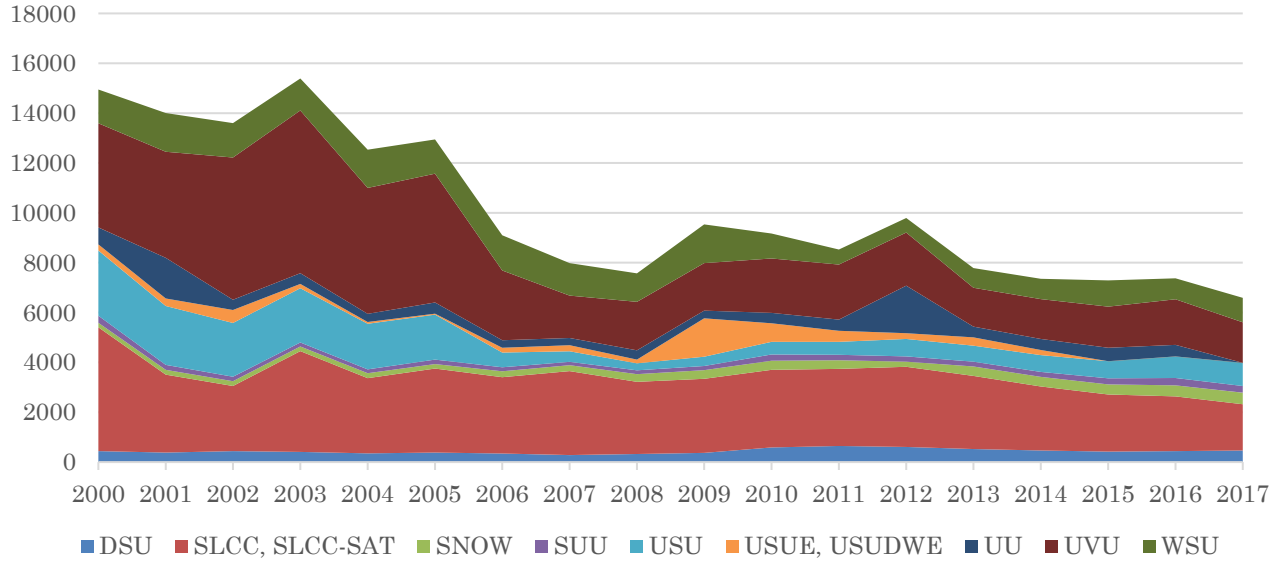
70% for most institutions (Figure 27). The total number of these students at all USHE institutions appears to be decreasing over time (Figure 28).

Figure 27. Percent Female of First-Term* First-Year Enrollees Not Within 12 Months of High School Graduation (FF)



* First term the student appeared in the Students Data Submission File, not necessarily the student's first term in a postsecondary institution.

Figure 28. Total Number of First-Term* First-Year Enrollees Not Within 12 Months of High School Graduation (FF)



* First term the student appeared in the Students Data Submission File, not necessarily the student's first term in a postsecondary institution.

Continuing Students

Students **not** in the first-time student categories (FH and FF) include high school students, undergraduate transfer students (TU), undergraduate students who are continuing after attending the previous term (CS) or after having stopped out for a period of time (RS), nonmatriculated students (NM, CE, NC), and graduate students in similar categories (NG, TG, CG, and RG). In this cross-sectional analysis we summarize these students by class level. Students with the class level Freshman, Sophomore, Junior, or Senior are presented by institution in Figures 29-33.

Women are overrepresented among freshmen (Figure 29) and sophomore (Figure 30) students at most USHE institutions. These designations are primarily based around credit hours earned, so these categories include students who intend to continue toward junior and senior status as well as those pursuing only an associate degree or less. But women also make up at least 50% of junior and senior students at all institutions except for Utah Valley University and the University of Utah (see Figures 31 and 32). Across all USHE institutions, since about 2007 the gap in representation among class levels has narrowed. By 2017 women make up between 47-55% of all undergraduate class levels.

Figure 29. Percent Female of Freshmen Students at USHE Institutions

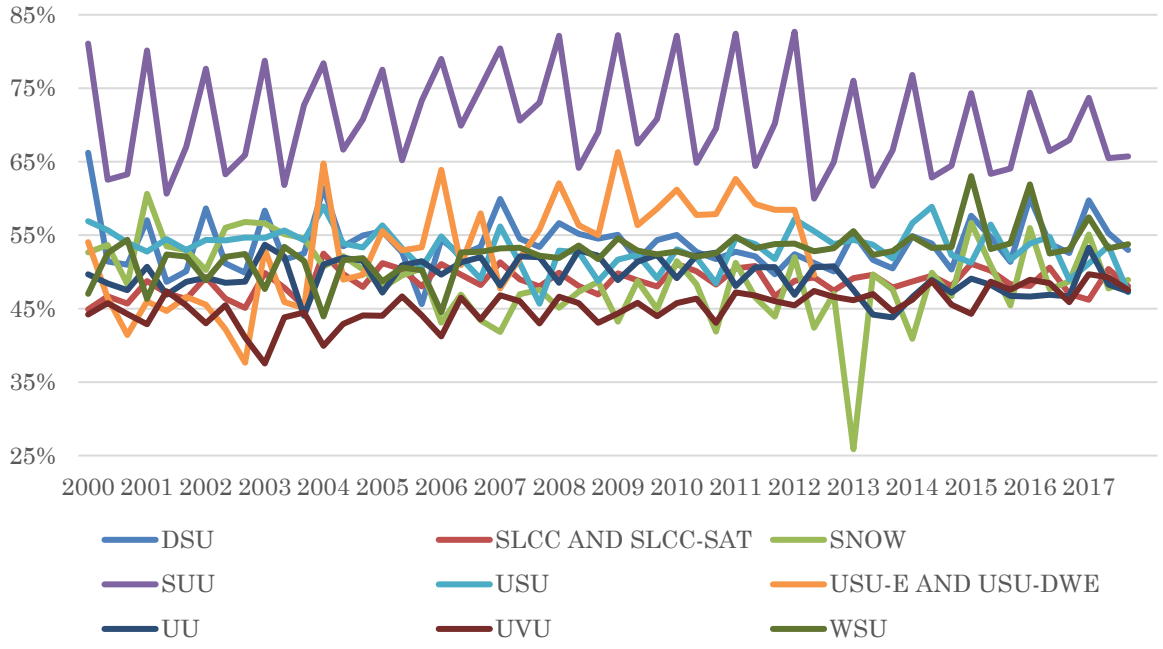


Figure 30. Percent Female of Sophomore Students at USHE Institutions

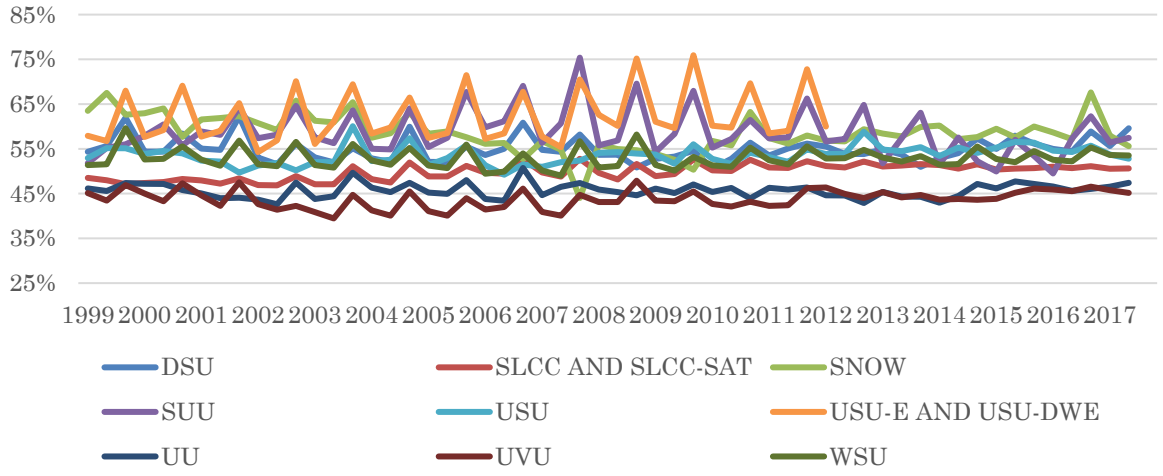


Figure 31. Percent Female of Junior Students at USHE Institutions

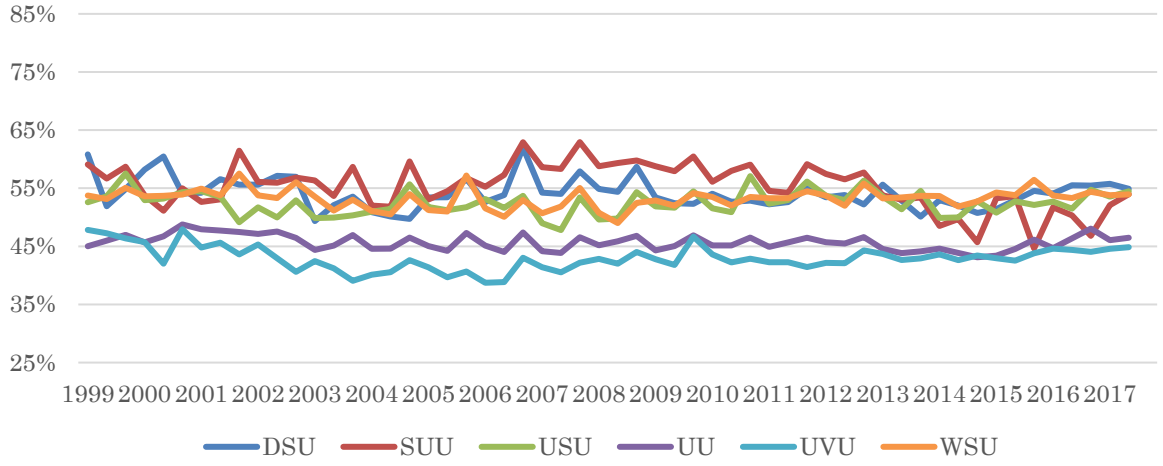


Figure 32. Percent Female of Senior Students at USHE Institutions

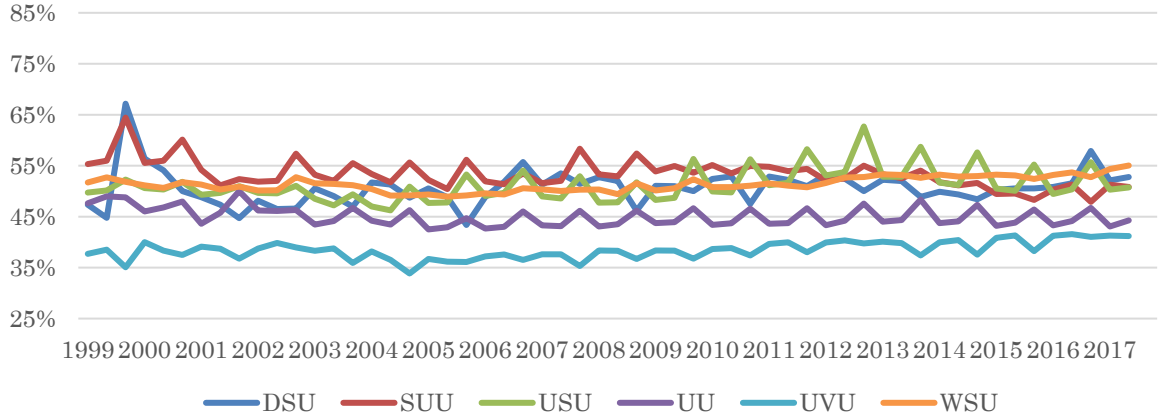
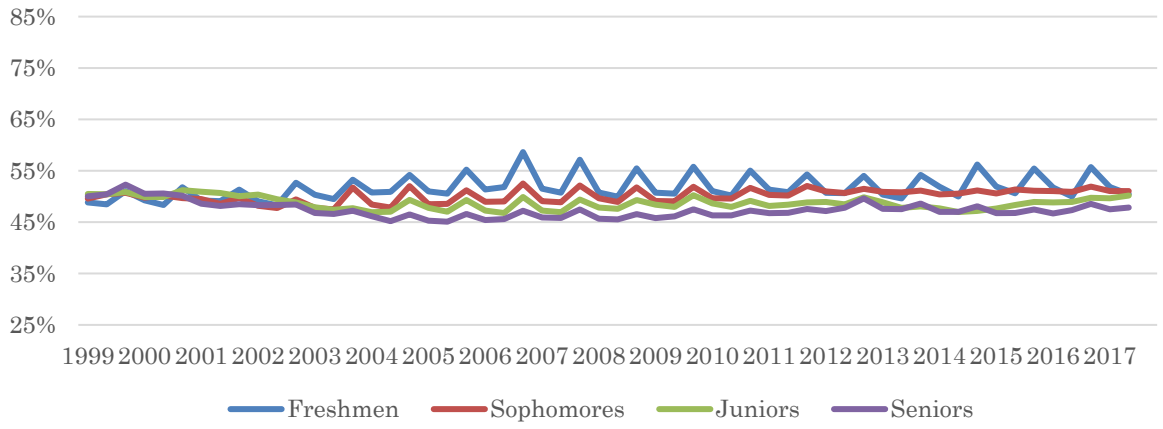


Figure 33. Percent Female of Students by Level at USHE Institutions



Graduate students fall into six class level categories: Master's (GM), Doctorate (GD), unclassified (GN), professional medicine (PM), professional (other) medicine (PO), and professional law (PL). Smaller group sizes introduce more noise into our cross-sectional data for these levels, but we see clear and disparate patterns in institutional enrollment at these levels. With the exception of UVU between 2010-2011, Southern Utah University has consistently enrolled the highest percentage of women at the master's degree level (Figure 34). Utah State University approached SUU's level (approximately 64%) between 2006-2008, while Weber State and the University of Utah's master's students were approximately 55% female around 2000-2002. In most other years, over 50% of master's students at the University of Utah, Utah Valley University, and Weber State University have been male.

At the University of Utah (the only USHE institution offering law and medical degrees), women's representation varies by degree type (Figure 35). Until 2010 women made up more than 50% of "other medical" doctoral students, but except for in 2002 they were less than half of law students. More than half of medical students have been male since 2000 except for in the years 2009, 2013, 2015, and 2017.

Figure 34. Percent Female of Graduate – Master's Students at USHE Institutions

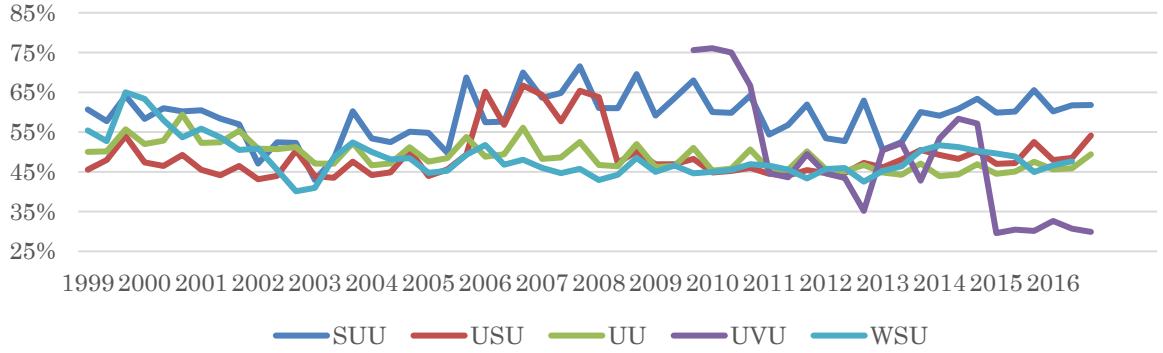
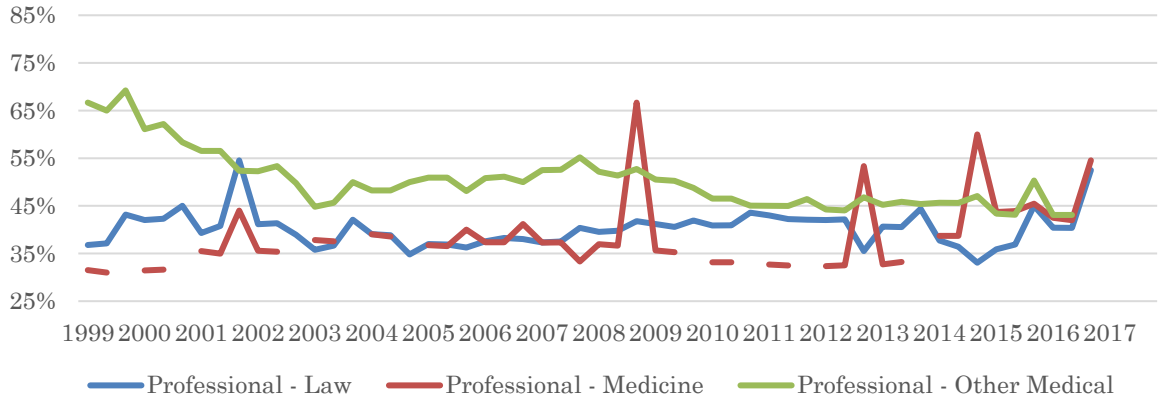


Figure 35. Percent Female of Professional Law, Medicine, and Other Medical Students at The University of Utah



Fields of Study

Literature on gendered patterns in education frequently focuses on three types of segregation in postsecondary educational attainment: vertical segregation, horizontal segregation, and prestige segregation. Vertical segregation exists when men and women are not equally represented across degree, certificate, and award levels.[37] As US women began to outnumber men in bachelor's degree attainment without an associated shift in economic and occupational outcomes,[38] attention shifted to horizontal and prestige segregation in educational activities. Horizontal segregation refers to the extent to which men and women pursue gendered fields of study (e.g., education for women or engineering for men).[39] Prestige segregation exists when men and women are not equally represented in the most prestigious institutions and majors (e.g., the most selective colleges/universities and the most financially rewarding majors).[40]

Although it is beyond the scope of this study to determine post-completion outcomes, we do investigate whether men and women are segregated across fields of study. Figures 36 and 37 show the representation by gender across fields of study (CIP categories) in USHE institutions between 2000-2017 (all CIP categories are represented in the chart, and the top 10 categories for men and women are listed in the legends). Across all USHE institutions, the most popular fields of study for both men and women are in the "Liberal Arts and Sciences, General Studies and Humanities" category (CIP code 24). The "Health Professions and Related Programs" and "Business, Management, Marketing, and Related Support Services" categories also appear near the top for both men and women, though we do see some segregation in the education and engineering fields.

Figure 36. Women's Enrollment by Field of Study in USHE Institutions

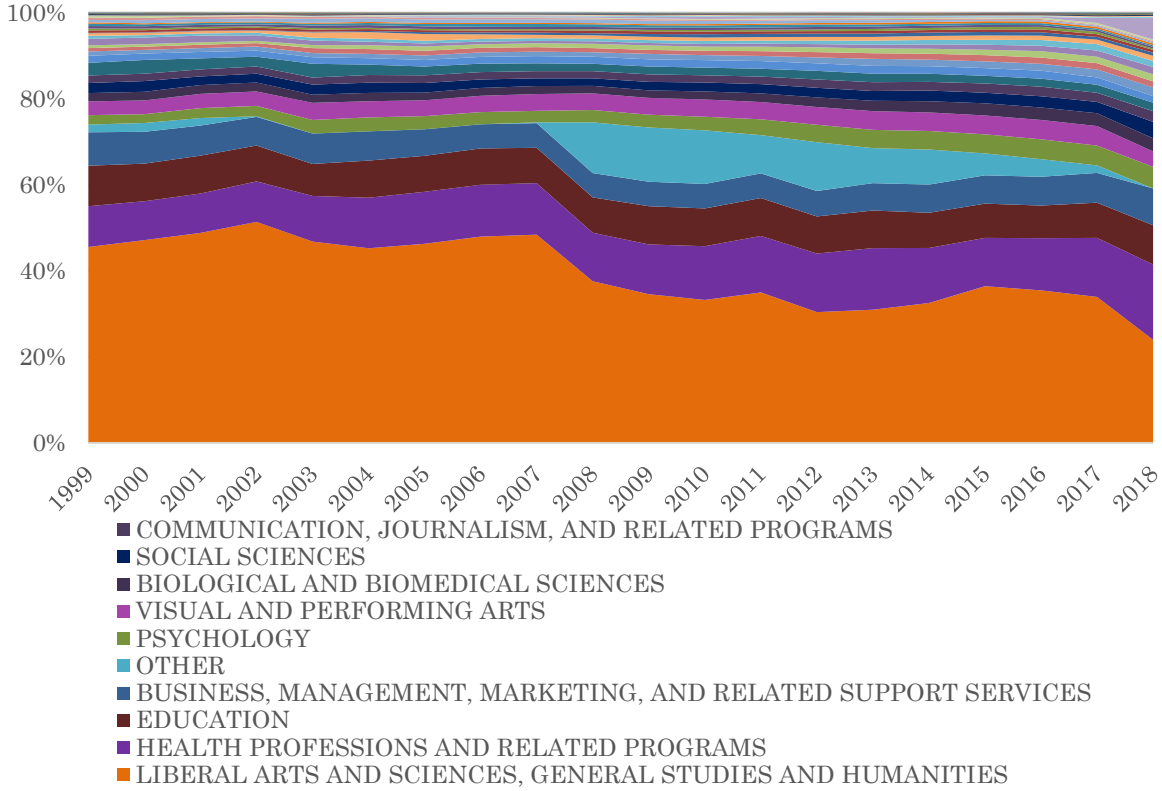
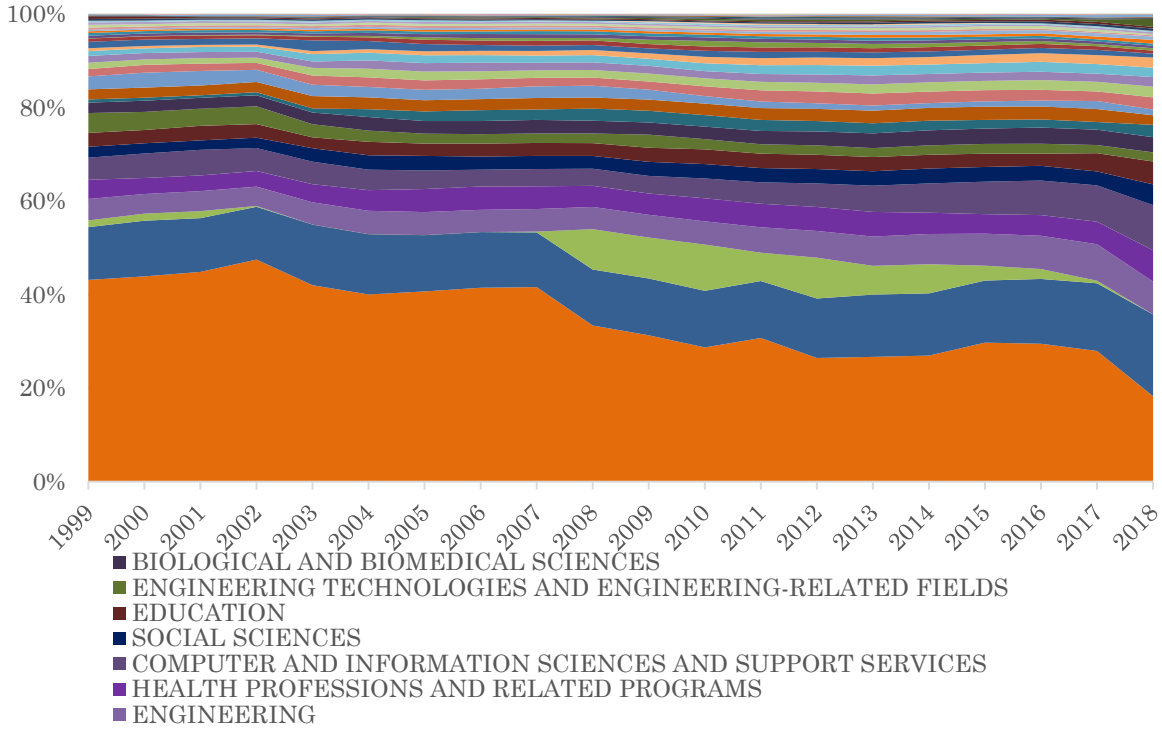
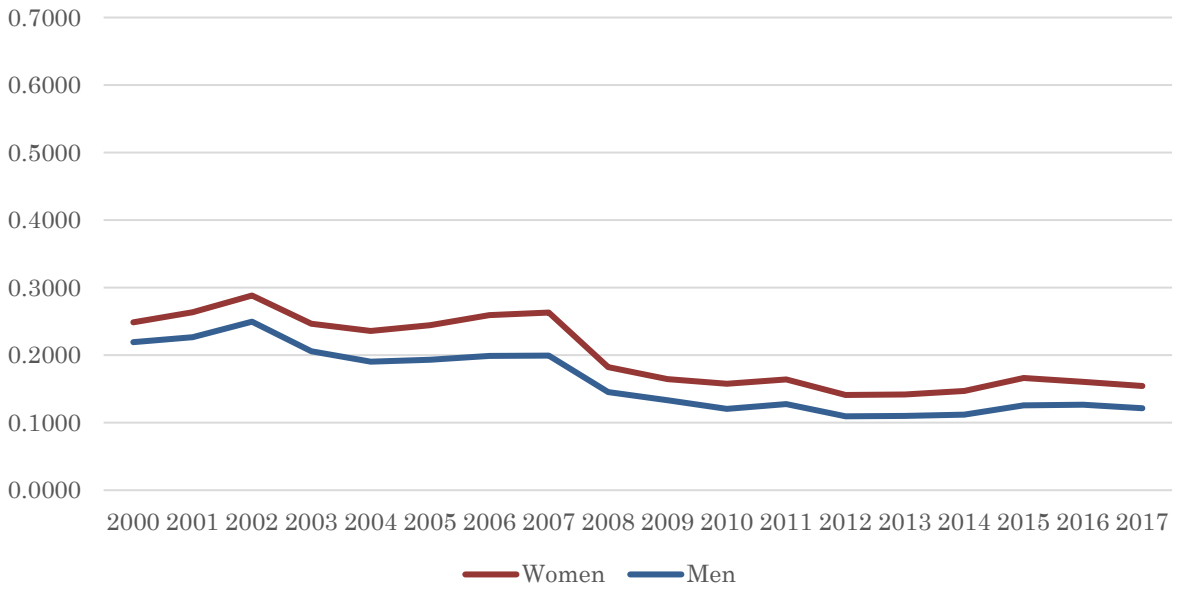


Figure 37. Men's Enrollment by Field of Study in USHE Institutions



To better clarify the distribution of men and women across fields and institutions over time we calculate a Herfindahl index separately for men and women for each year. The Herfindahl index is traditionally used to determine market share of firms in a given area,[41] but it can also be used to measure the extent to which students are evenly distributed across fields of study. The index is calculated by dividing the count in a category by the total count across all categories, squaring the quotient for each category, and summing all of the squared quotients. The index can range from 0 to 1, and a higher value indicates **less** diversity across firms. Index values for men and women across all USHE institutions are displayed in Figure 38. The higher line for women indicates less diversity; they are unevenly distributed across fields of study. Comparatively, men are more evenly distributed across fields of study. Representation across fields of study is becoming more diverse over time for both men and women.

Figure 38. Herfindahl Indexes for Men and Women Enrolled at USHE Institutions



Men's and women's distribution across fields of study is also listed in Table 11. Here we present the top 10 field of study categories for men and women enrolled in USHE institutions for the year 2015 (a recent year chosen for the distance between men's and women's Herfindahl indexes). Liberal Arts is the top category for both groups, with 30% of men and 36% of women enrolled in this category. About 76% of men and 84% of women are represented in the top 10 categories. The higher percentage of women clustered in these categories corresponds to the higher index for that year, showing less diversity in field of study.

Table 11. Top 10 Field of Study Categories for Men and Women Enrolled in USHE Institutions

Field of Study Category	Percent of Enrollees (Men)	Percent of Enrollees (Women)	Field of Study Category
Liberal Arts and Sciences, General Studies and Humanities	30%	36%	Liberal Arts and Sciences, General Studies and Humanities
Health Professions and Related Programs	13%	11%	Business, Management, Marketing, and Related Support Services
Education	7%	8%	Computer and Information Sciences and Support Services
Business, Management, Marketing, and Related Support Services	7%	7%	Engineering
Other	4%	5%	Health Professions and Related Programs
Psychology	3%	4%	Biological and Biomedical Sciences
Visual and Performing Arts	3%	4%	Other
Biological and Biomedical Sciences	3%	3%	Social Sciences
Social Sciences	3%	2%	Education
Communication, Journalism, and Related Programs	3%	2%	Visual and Performing Arts
Total	76%	84%	

Men's and women's distribution across field of study categories varies by institution. Figures 39 through 47 show the Herfindahl index for each USHE institution over time. In most institutions, distribution of men and women across

fields of study is becoming more diverse over time. Women's enrollment is less diverse compared to men in all years at DSU, SLCC and SLCC-SAT, SUU, USU, UVU, and WSU. Men's enrollment across fields of study is less diverse between 2011-2015 at Snow College, from 2013 on at USUE and USUE-DWE, and from 2013 in the University of Utah. Men and women make similar moves into and out of fields of study in some cases; for example, the jump in the Herfindahl index at Snow College beginning in 2011 (Figure 41) is due to an increase in liberal arts enrollment for both men and women. Similarly, the decline at UVU ending in 2003 (Figure 45) is due to a decline in liberal arts enrollment.

Figure 39. Herfindahl Indexes for Men and Women Enrolled at Dixie State University

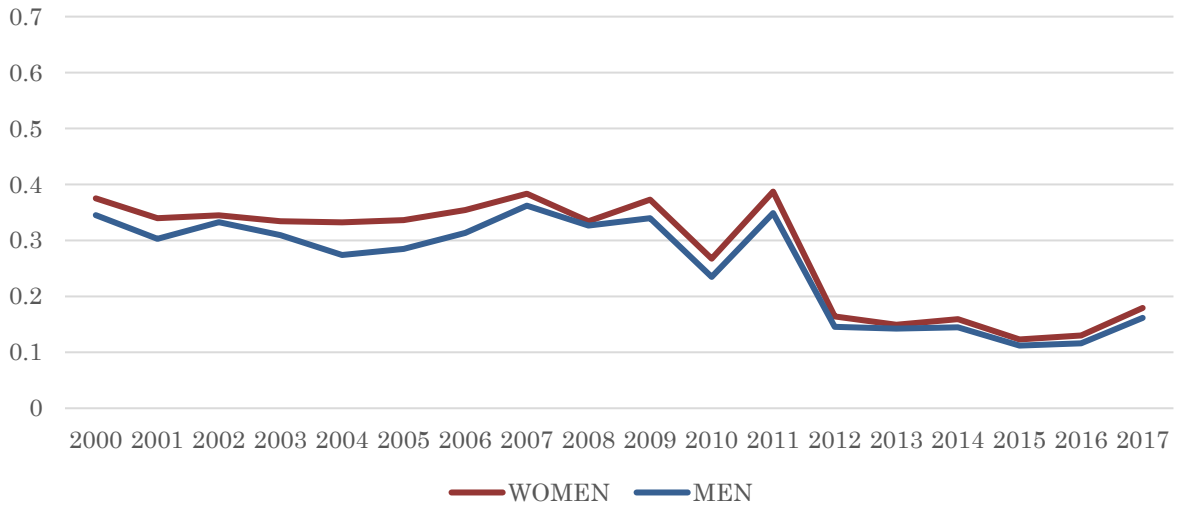


Figure 40. Herfindahl Indexes for Men and Women Enrolled at SLCC and SLCC-SAT

Figure 41. Herfindahl Indexes for Men and Women Enrolled at Snow College

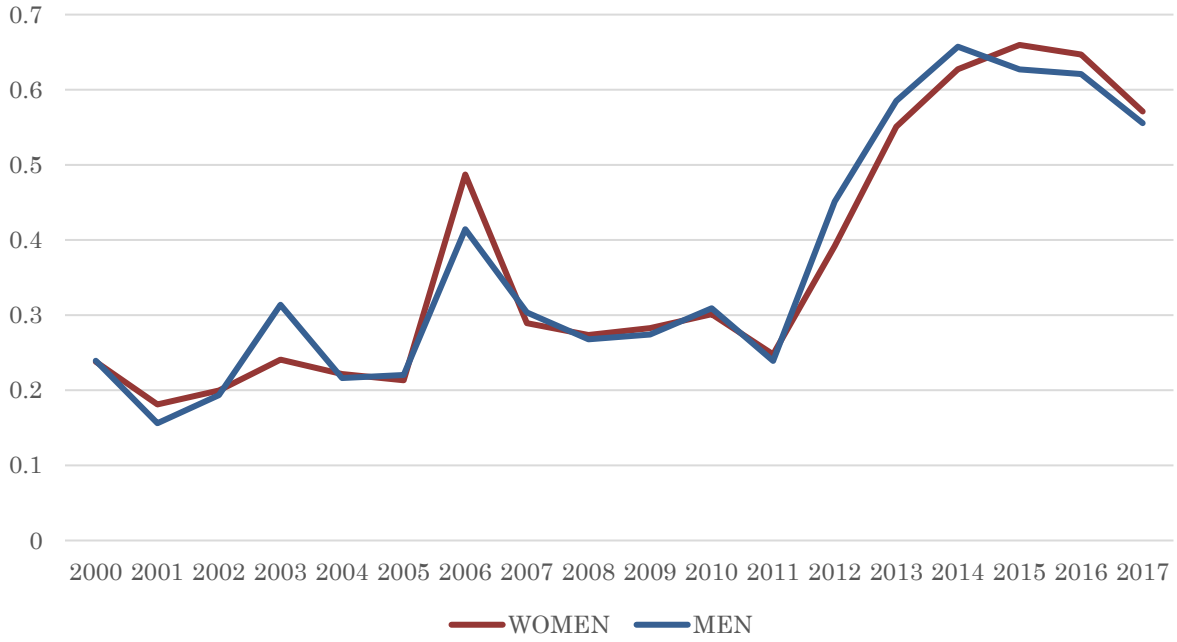


Figure 42. Herfindahl Indexes for Men and Women Enrolled at Utah State University

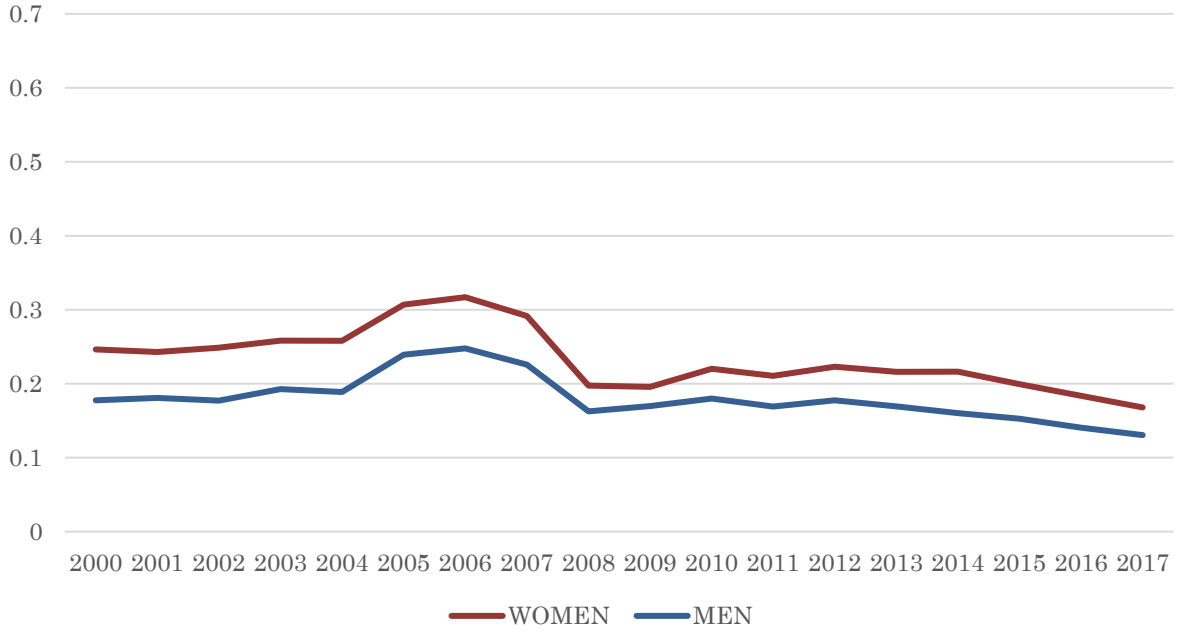


Figure 43. Herfindahl Indexes for Men and Women Enrolled at USUE and USUE-DWE

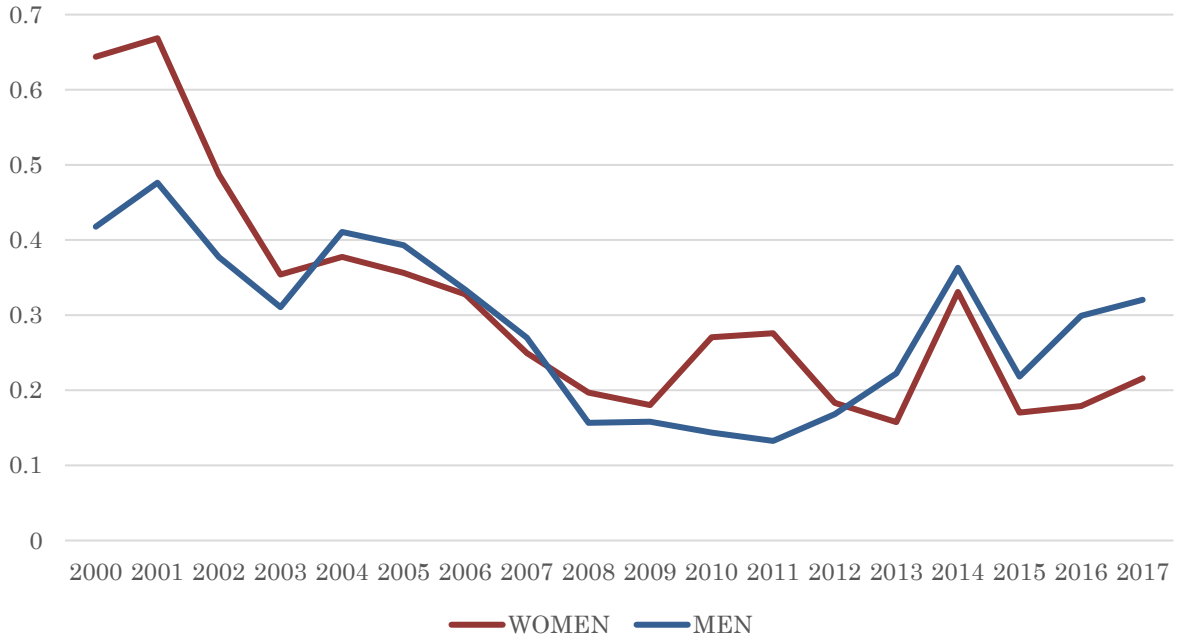


Figure 44. Herfindahl Indexes for Men and Women Enrolled at the University of Utah

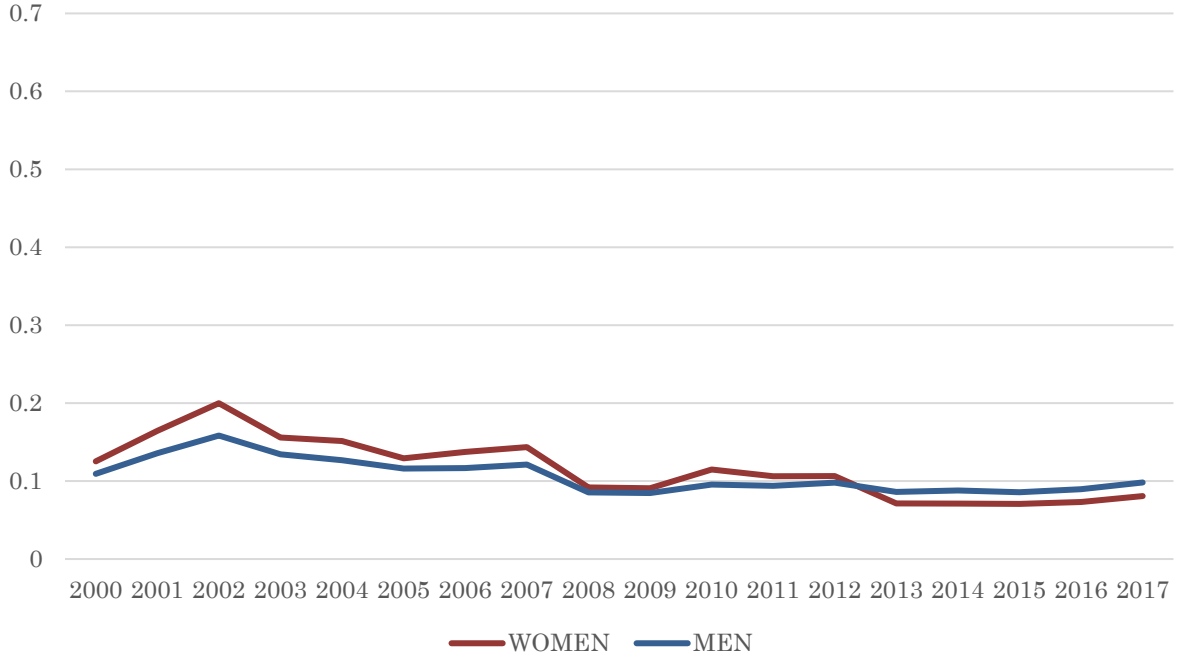


Figure 45. Herfindahl Indexes for Men and Women Enrolled at Utah Valley University

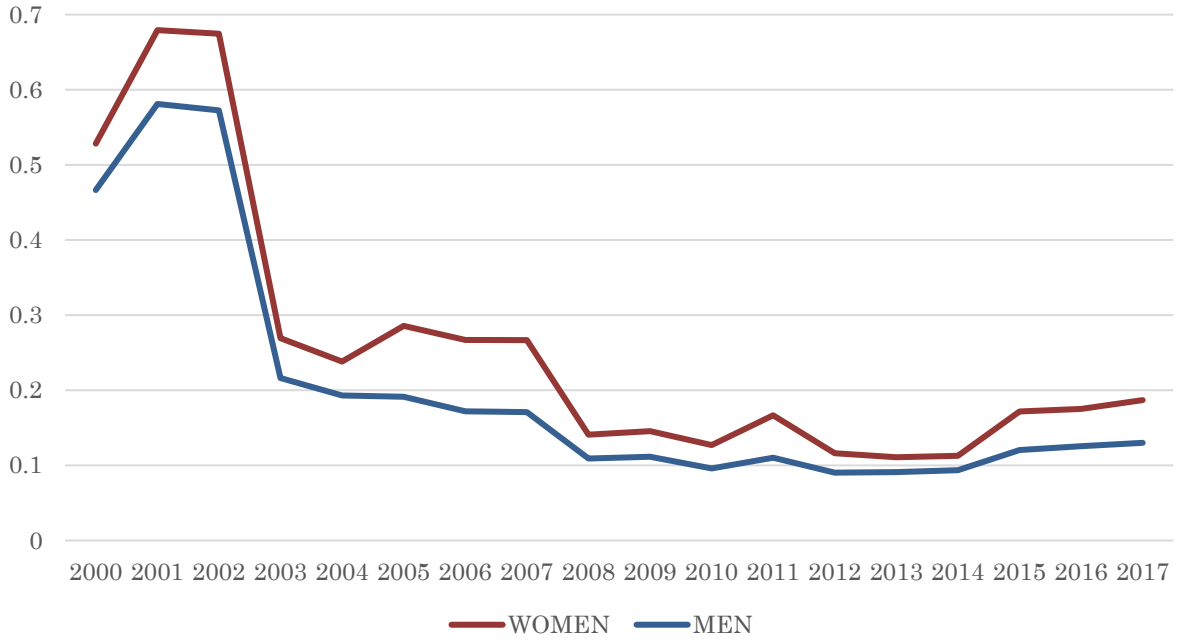
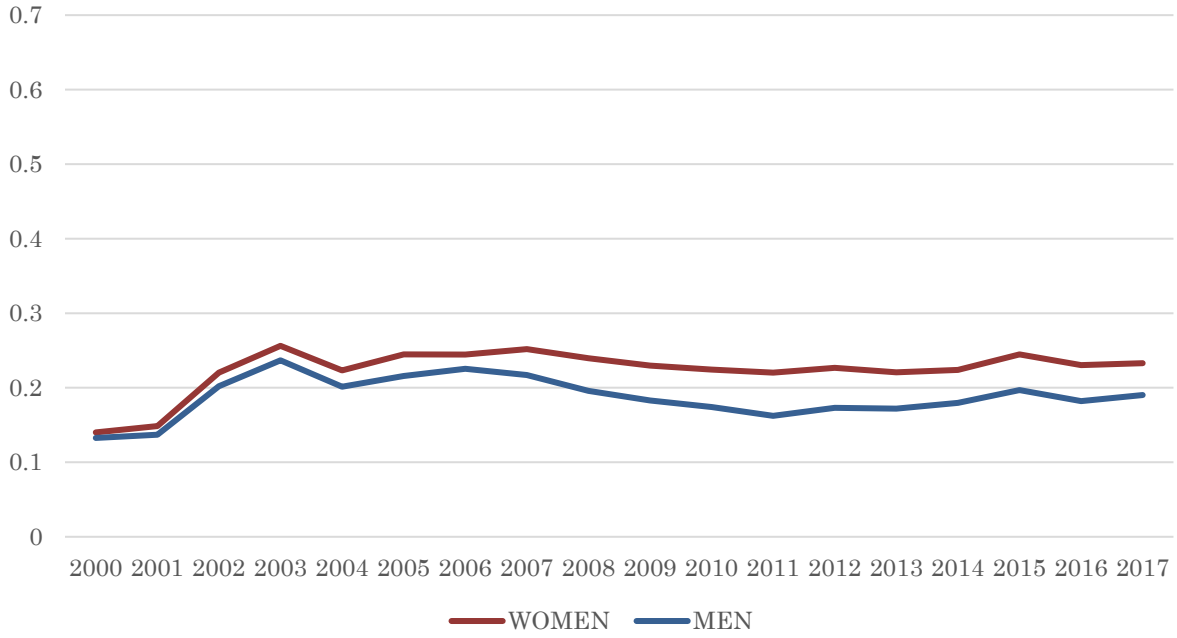


Figure 46. Herfindahl Indexes for Men and Women Enrolled at Weber State University



Completions

We examine USHE completions more thoroughly in our Life Course section, but we present male and female award, certificate, and degree completions by institution in

figures 47 through 55. As with all institution-specific tables, percentages based on fewer than 10 students are omitted.

Women make up 50% or greater of graduating students at nearly every level in each USHE institution. These percentages are highest for the certificates and awards below an associate's degree; at Dixie State (Figure 47), SLCC/SLCC-SAT (Figure 48), Snow College (Figure 49), USUE/USUE-DWE until 2011 (Figure 50), UVU until 2003 (Figure 51), and Weber State until 2005 (Figure 52) these awards represent the highest concentration of women and, in some cases, are nearly exclusively women (for example, in 2005 97% of less-than-1-year certificates at SLCC/SLCC-SAT were awarded to women). Women are also overrepresented in associate degrees at most institutions, generally earning around 60% of these degrees. We see more parity at the bachelor's and master's degree levels, but this too varies by institution. Women have earned between about 40-50% of bachelor's degrees in recent years at most USHE institutions and earn closer to 60% of bachelor's degrees at Southern Utah University. Beyond the bachelor's level, female representation among graduating students generally goes down as the degree level goes up with a few exceptions; since 2005, women have earned the majority of master's degrees at Southern Utah University (Figure 50). Since 2007 women have earned more than 50% of post-baccalaureate certificates at the University of Utah (Figure 53), and between 2010-2012 women earned the majority of master's degrees at Weber State University (Figure 55).

Figure 47. Percent Female of Dixie State University Graduates by Award Level

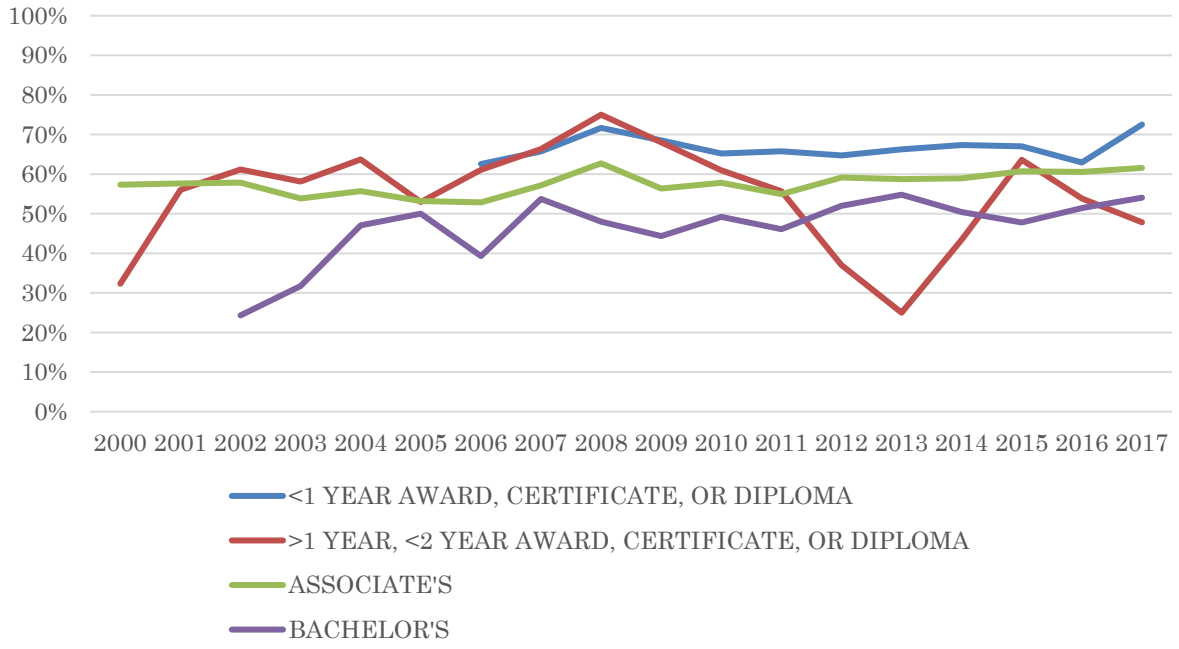


Figure 48. Percent Female of SLCC and SLCC-SAT Graduates by Award Level

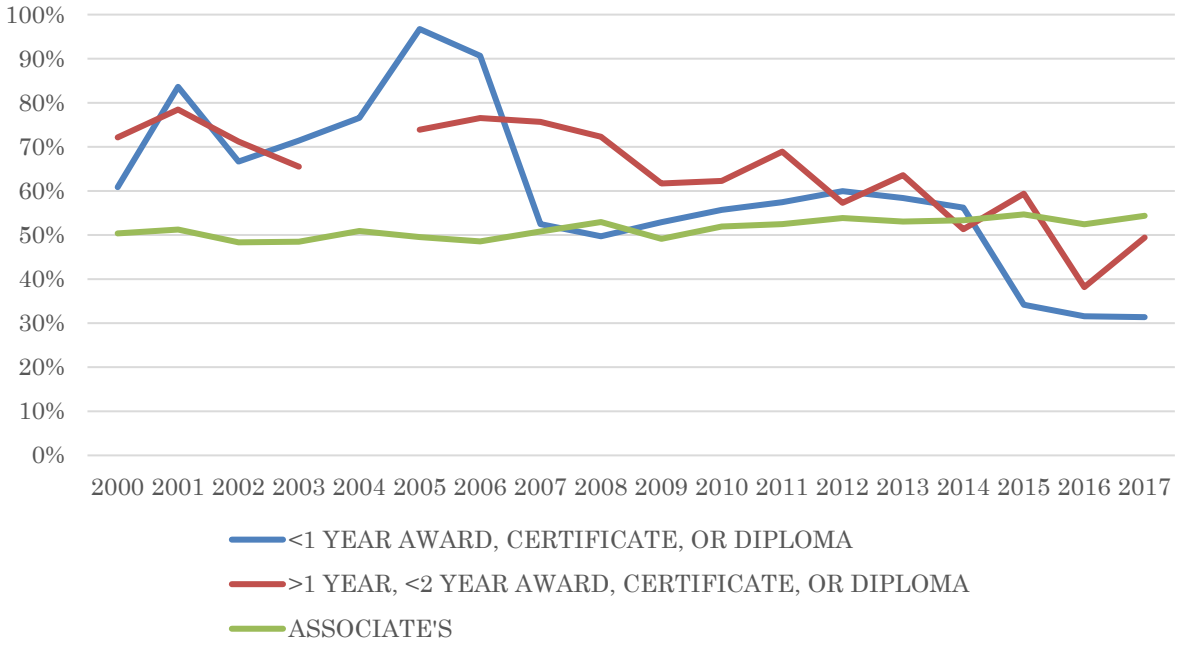


Figure 49. Percent Female of Snow College Graduates by Award Level

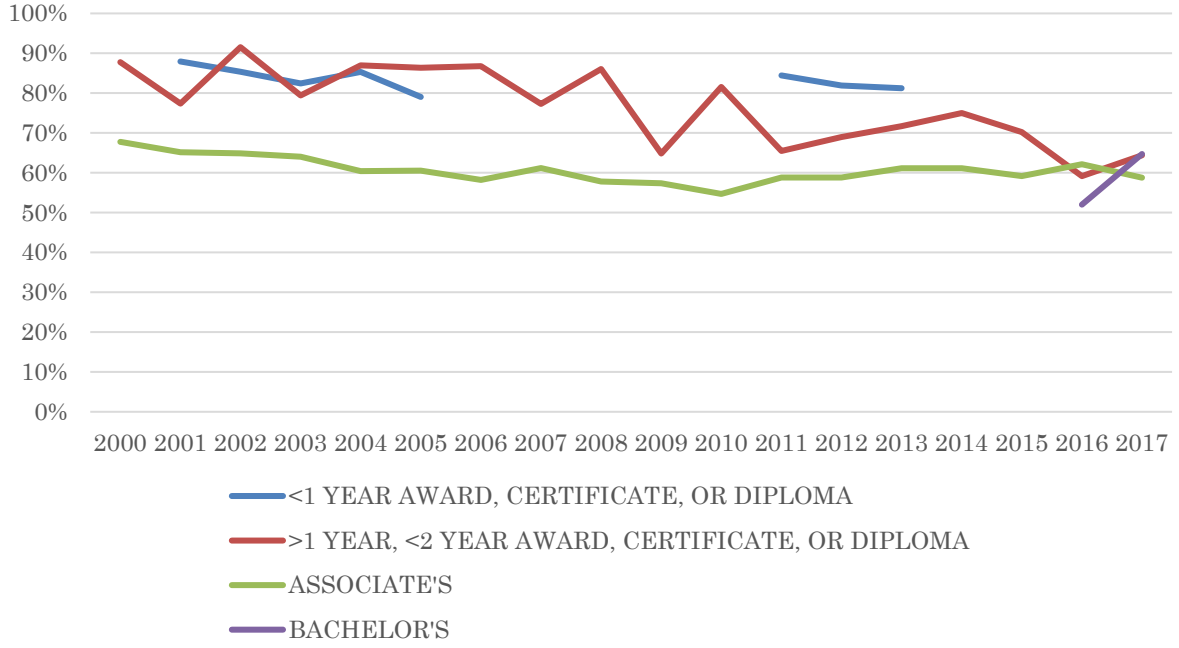


Figure 50. Percent Female of Southern Utah University Graduates by Award Level

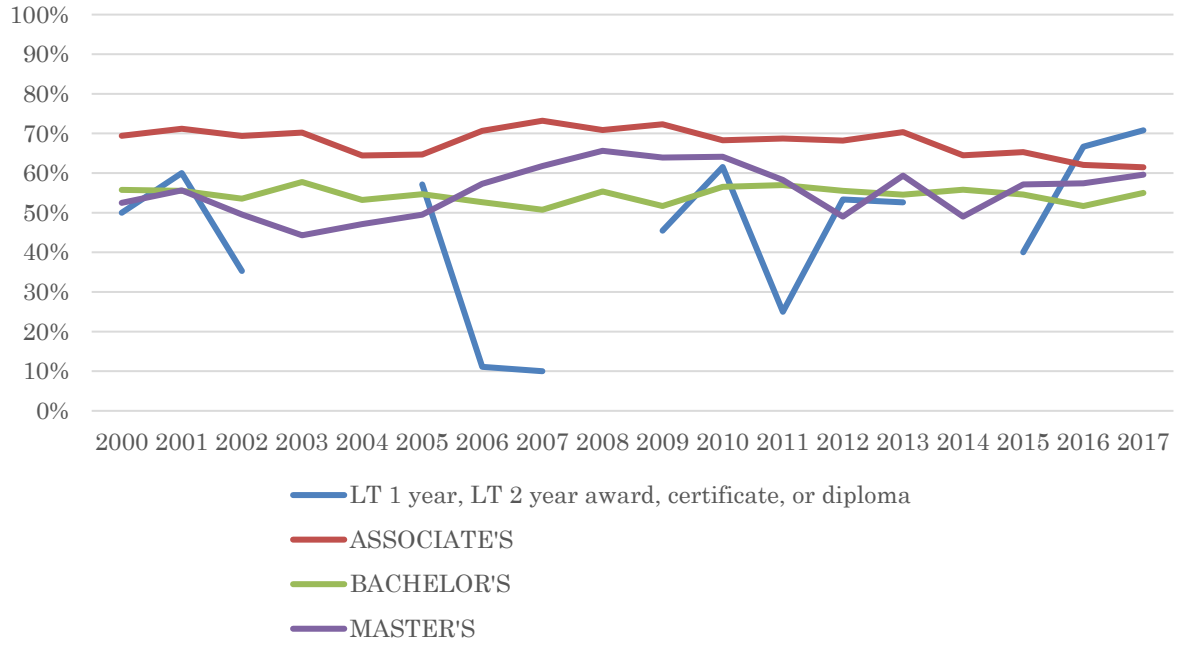


Figure 51. Percent Female of Utah State University Graduates by Award Level

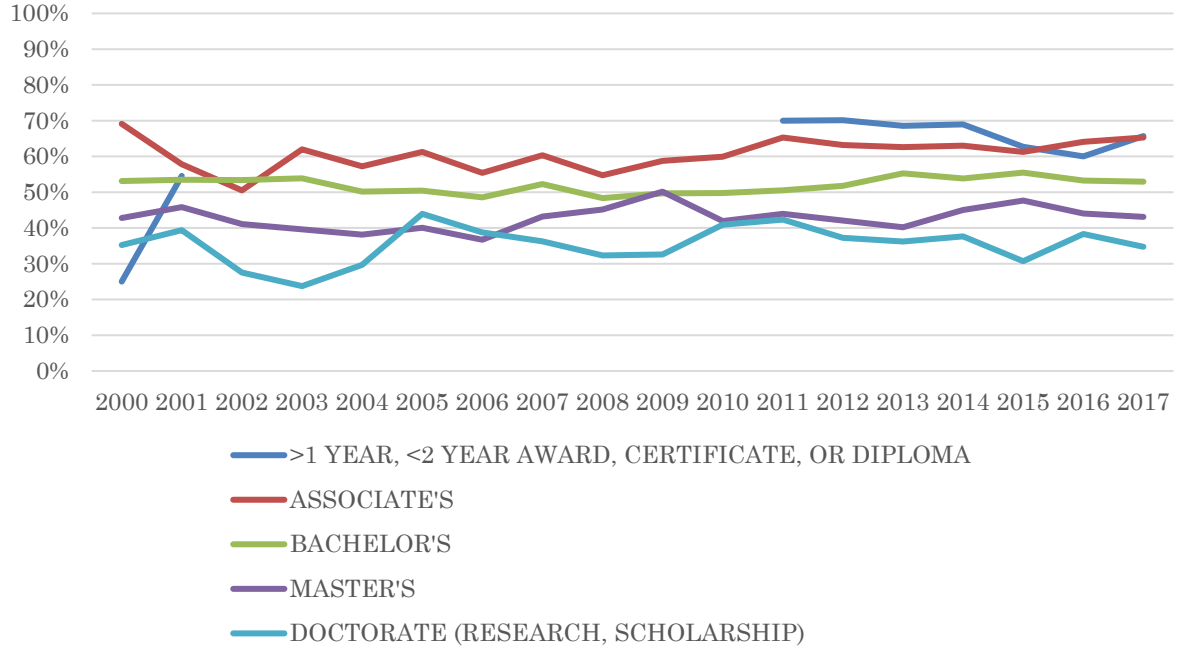


Figure 52. Percent Female of USUE and USUE-DWE Graduates by Award Level

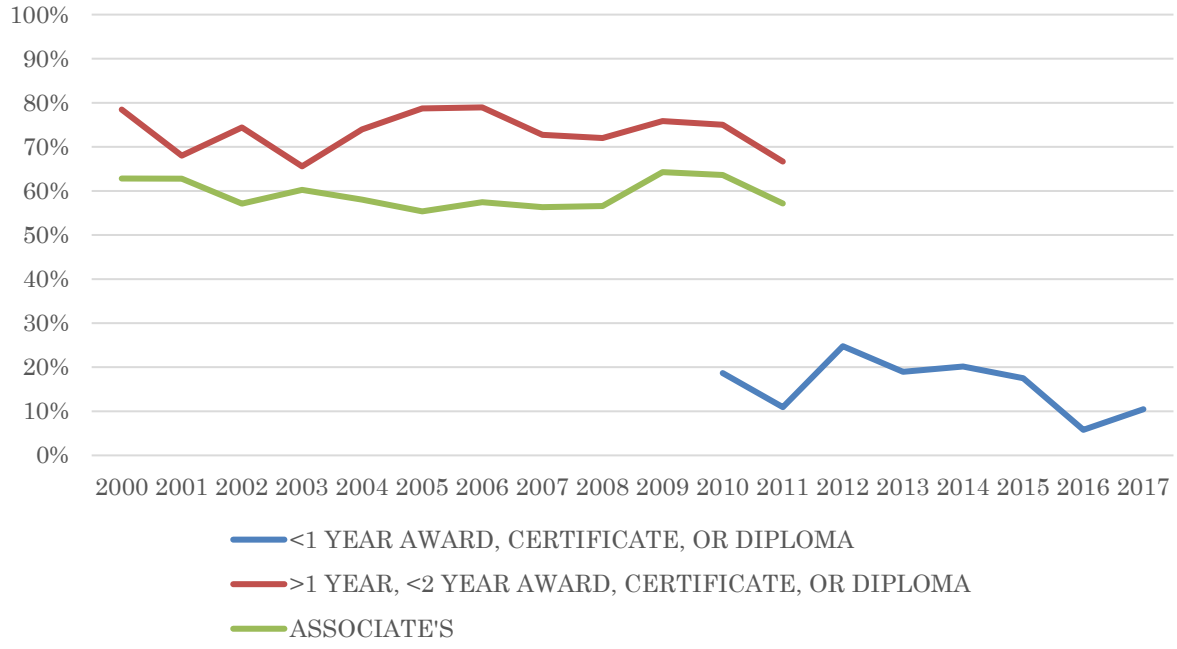


Figure 53. Percent Female of University of Utah Graduates by Award Level

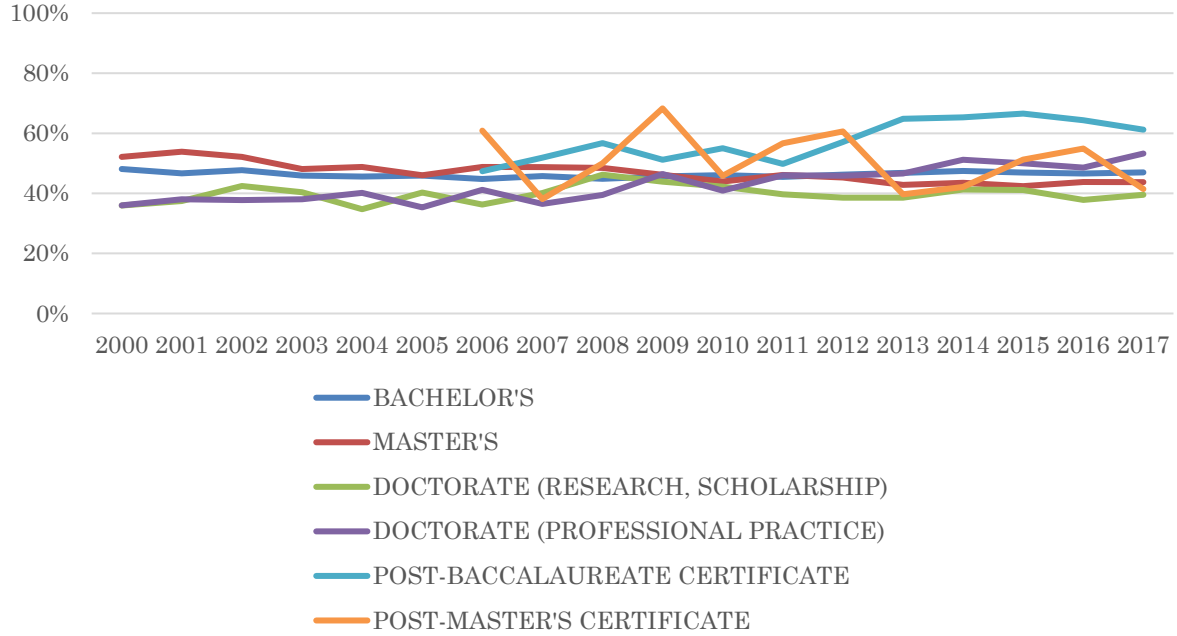


Figure 54. Percent Female of Utah Valley University Graduates by Award Level

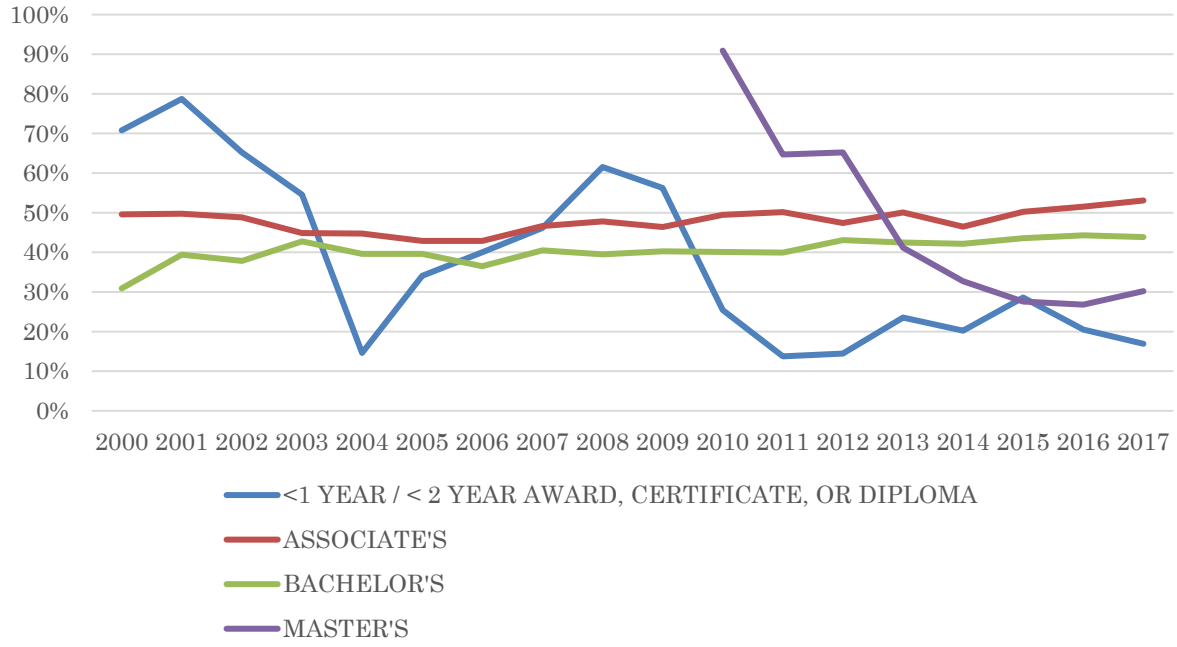
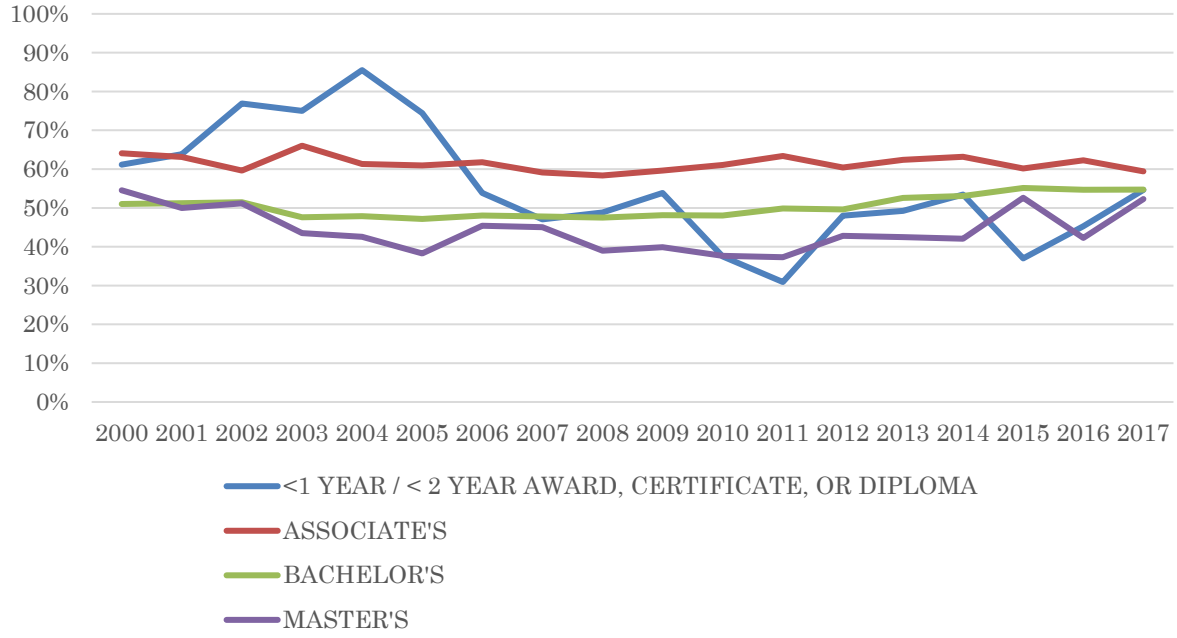


Figure 55. Percent Female of Weber State University Graduates by Award Level



As with students who are enrolled in a USHE institution, students who graduate from a USHE institution show gendered patterns in field of study. These patterns are most salient when comparing STEM fields with non-STEM fields, and they differ across USHE institutions.

Figures 56 and 57 show the percent female of graduates in STEM and non-STEM fields for each institution. All presented percentages are based on totals greater than 10, but in each institution except for USUE and USUE-DWE there are fewer total graduates in STEM fields compared to non-STEM fields. In 2016, for example, USUE/USUE-DWE have the far highest percentage of students graduating in STEM fields (69%). This is followed by the University of Utah (22%), Utah State University (18%), SLCC and SLCC-SAT (12%), Utah Valley University (12%), Weber State University (12%), Southern Utah University (10%), Snow College (9%), and Dixie State University (3%).

Women are generally overrepresented among graduates of non-STEM fields (Table 35). Between 2000 and 2017 the percent of female non-STEM graduates ranged from about 42% (UVU in 2006) to 71% (Snow College in 2000, excluding the USUE/USUE-DWE jump to 88% in 2015). In general, these percentages cluster between about 45% to 65%.

Conversely, men are overrepresented among graduates of STEM fields (Figure 56). Between 2000-2017 the percent of female STEM graduates ranged from about 10% (UVU in 2002, excluding the USUE/USUE-DWE decline to 2% in 2016) to about 50% (Snow College at 48% in 2000, Dixie State University at 54% in 2000). No institution had greater than 50% female STEM graduates after the year 2000, and the percent of female STEM graduates didn't exceed 40% after 2003.

Figure 56. Percent Female of Non-STEM Graduates from USHE Institutions

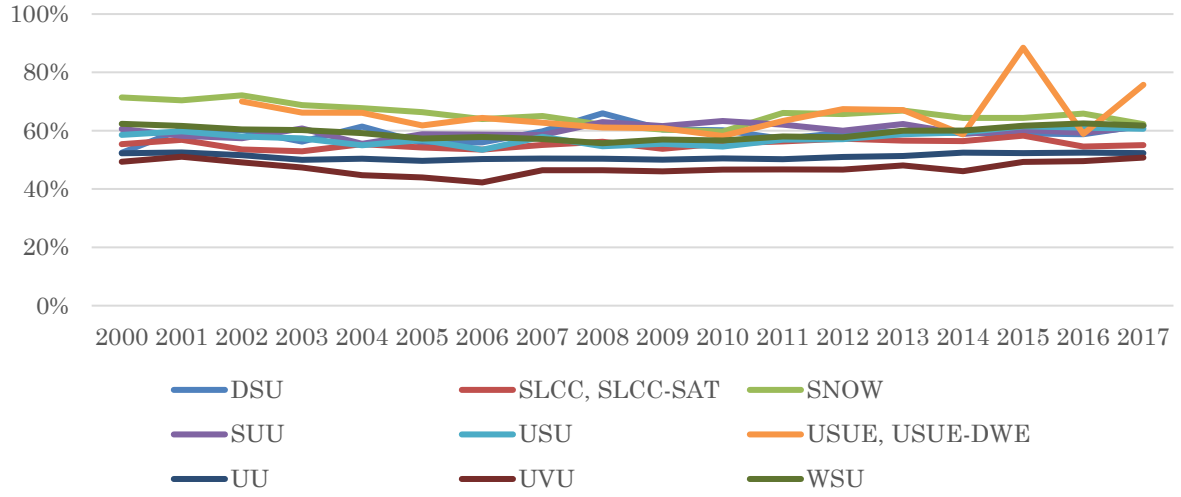
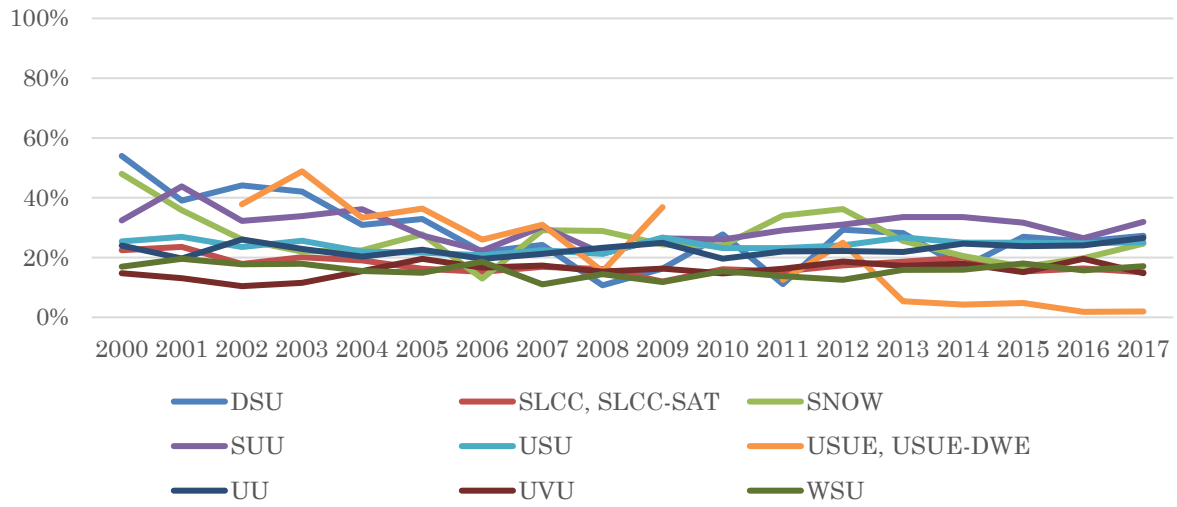


Figure 57. Percent Female of STEM Graduates from USHE Institutions



Life Course

It is tempting to compare cross-sectional data across time and institutions and come to causal conclusions about enrollment, persistence, and completion. However, with cross-sectional data we can't know whether we are measuring the same students or completely different cohorts. In Utah, especially, we may see students stopping out for LDS mission service and/or childbearing at a greater rate than in other states. Consequently, it's difficult to make conclusions about how men and women are faring in postsecondary educational activities without longitudinal data.

In this section we use anonymized, individual-level longitudinal data from 2000-2017 to follow students from first enrollment to completion or most recent enrollment. This approach allows us to identify when students first enroll (or first appear in the student file), when they stop out, when they return, and when they complete their intended certificate or degree (or last appear in the student file). We can also explore how student characteristics are associated with persistence and completion for men and women.

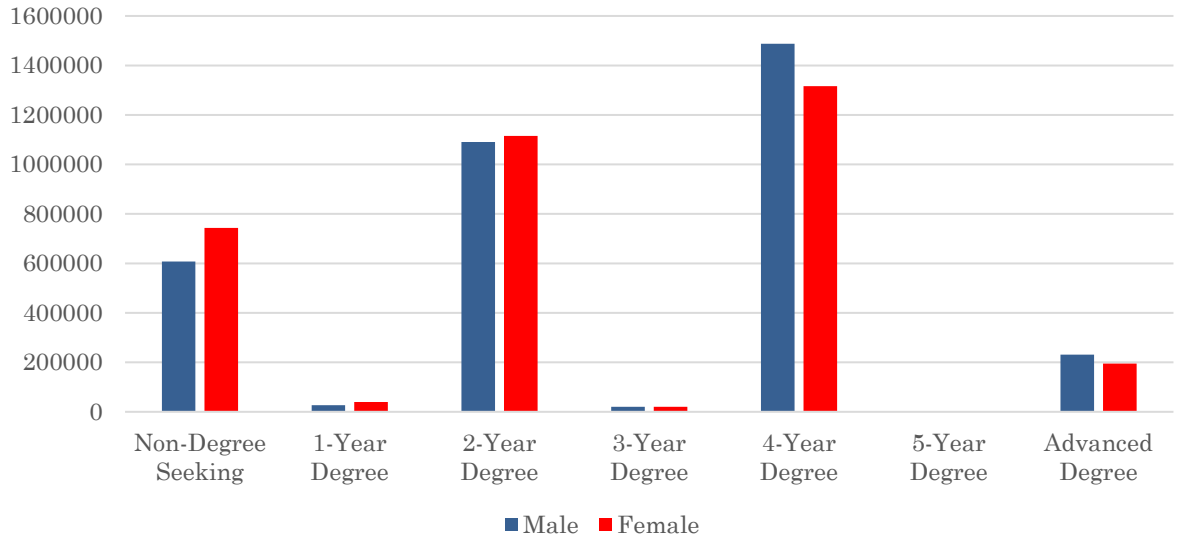
USHE Student File

Our data begin in the year 2000, omitting any prior educational activities. This biases our analysis such that students at the early end of our data may seem to reach completion in fewer terms compared to later students. Our data are also censored on the right, ending with the year 2017; without accounting for this censoring, students in later years may seem less likely to graduate. We also recognize that time is not equally associated with completion through our data

period (2000-2017). Norms, course offerings, and many other unmeasured factors may influence how quickly students graduate, and these influences may change over time. For example, attending school for 5 terms may be differentially associated with completion in the year 2004 compared to the year 2014. Finally, we include several individual-level (anonymized and binned) student characteristics that we anticipate are associated with postsecondary education persistence and completion.

The USHE student file includes 11 degree intent categories, 7 of which are shown in Figure 58. This chart depicts person-term counts rather than individuals, so the counts do not represent the number of unique people in each category. They also may include within-person changes in degree intent over time. But we see that, overall and in the terms covered by our dataset, more enrolled women report lower degree-seeking intentions compared to enrolled men.

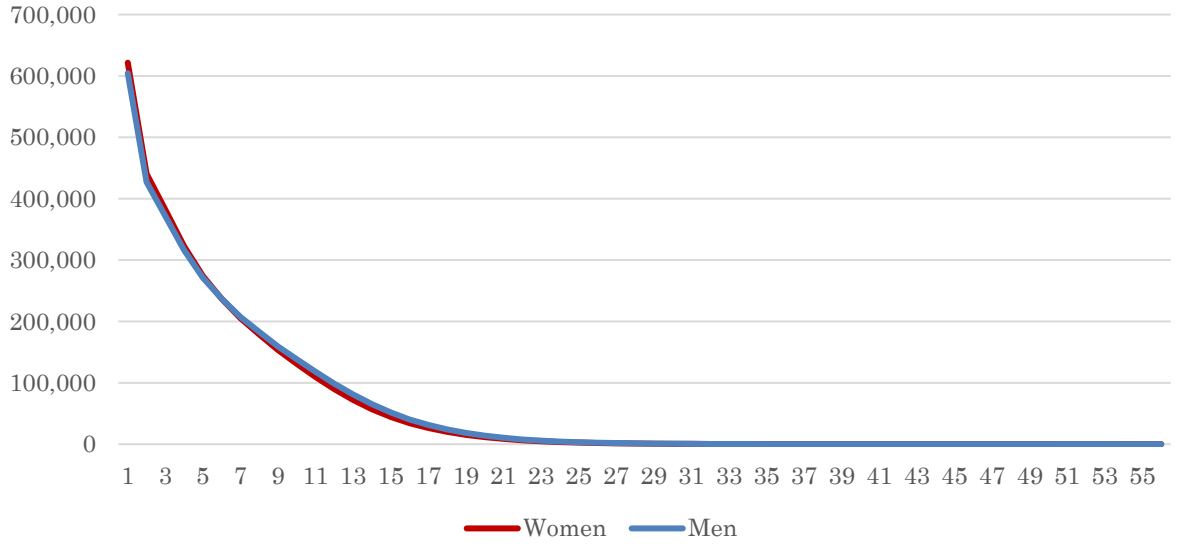
Figure 58. Number of Students Enrolled in USHE Institutions (Person-Term) by Degree Intent, 2000-2017



As mentioned previously in this report, we categorized institutions according to the highest degree level offered (preventing identification of individual institutions to ensure student privacy). We also used age groups for under 18 and over 60. We grouped ACT scores into 5 categories (though about 60% of students didn't have an ACT score listed), GPA into 6 categories, term credit hours into 6 categories, and cumulative credit hours into 16 categories. We used binary variables for race/ethnicity (white and nonwhite), country of origin (US and not US), and state of origin (Utah and not Utah). Prior to stripping identification data from our file, we flagged terms in which the student reported a last name different from a last name used in a previous term as a proxy for change in marital status.

Our end file for analysis consists of person-term data for 57 terms, beginning with summer term 2000 and ending with the last term of the 2017-2018 academic year. In order to conduct a longitudinal analysis without linking unique student records across terms, we identify the first term a student appears in the student file and then count forward each additional term that student is enrolled. Figure 59 illustrates this structure by showing the enrollment for each term count in our student file for men and women. We see that the modal term number is 1, with 604,427 men and 621,621 women having been enrolled in a first term in the student file between 2000-2017.[42] Enrollment drops significantly after the first term for men and women and then continues to decrease until nearly all students have stopped attending by 28 terms.

Figure 59. Enrollment by Number of Terms in USHE Institutions for Men and Women 2000-2017



First Enrollment

Students in their first term in the student file are diverse. Table 12 lists descriptive statistics of these students for each year by gender. High school graduation year is not included for 89% of first-term students and is omitted from our analyses. The multiple institutions variable is a flag for students enrolled in more than one institution in their first term. Mean current age includes students 18-60 (ages outside that range include students 17 and younger or students 61 and older). Note that most students in earlier years will have a first term in the file that is not their first term as a postsecondary student; this is reflected in the decreasing average age through the years in this table. "White" indicates the percent of students who are classified as white versus other IPEDS race/ethnicity categories (Hispanic regardless of race; American Indian or Alaska Native; Asian; Black or African American; Native Hawaiian or Other Pacific Islander; two or more races). US and Utah are indicator variables representing a residence status in the US/outside of

the US and in Utah/outside of Utah. Registration status and degree intent are comprised of the mutually-exclusive categories discussed previously, with the smallest categories combined into the "other" field (again, note that changes in the proportion of students in these categories over time are primarily due to the shift from first-term-in-file students to first-term-in-school students). STEM CIP is a binary variable indicating whether the student is enrolled in a STEM field, and the "Part Time" row represents the percentage of students who are enrolled part time (versus full time).

Table 12. Descriptive Statistics for USHE Student Characteristics in Their First Term

	2000		2001		2002		2003		2004		2005	
	M	F	M	F	M	F	M	F	M	F	M	F
Multiple Institutions	1.85%	2.13%	1.76%	2.05%	1.83%	2.02%	1.53%	2.17%	2.17%	2.79%	2.54%	2.99%
Current Age (Mean)	27.33	29.11	27.51	29.45	28.34	30.21	28.01	30.12	27.72	30.05	27.67	30.42
White	67.71%	70.82%	65.00%	65.85%	61.59%	64.48%	60.94%	67.69%	59.79%	63.43%	60.22%	61.92%
US	88.37%	90.60%	89.35%	89.94%	86.12%	87.08%	92.60%	93.31%	90.34%	90.97%	90.79%	90.98%
Utah	78.04%	78.25%	77.10%	75.28%	73.38%	71.97%	67.66%	66.83%	73.49%	72.37%	75.15%	73.72%
Registration Status												
HS	14.47%	17.00%	14.95%	18.39%	14.46%	16.53%	18.98%	22.34%	19.32%	21.61%	26.50%	27.95%
FF (>12)	18.02%	12.68%	18.64%	13.29%	18.14%	13.40%	25.14%	17.77%	22.60%	15.24%	21.93%	16.52%
FH (<12)	8.56%	11.22%	6.82%	9.12%	7.38%	9.28%	10.45%	12.35%	15.58%	16.50%	11.21%	11.35%
NM	8.49%	11.66%	21.50%	22.97%	29.20%	28.56%	19.68%	19.87%	16.99%	20.10%	18.04%	19.26%
TU	7.20%	7.37%	7.53%	7.65%	8.08%	7.82%	9.79%	9.88%	10.53%	10.51%	9.36%	9.39%
RS	19.93%	15.89%	18.64%	14.56%	13.63%	12.10%	5.25%	5.39%	4.45%	5.14%	3.02%	3.17%
CS	20.96%	20.72%	8.77%	9.17%	7.59%	8.52%	7.57%	8.73%	7.65%	7.22%	6.47%	6.83%
Grad	2.37%	3.46%	3.16%	4.86%	1.51%	3.81%	3.15%	3.68%	2.88%	3.68%	2.82%	4.95%
Other	0	0	0	0	0	0	0	0	0	0	0.66%	0.59%
Degree Intent												
Non-Degree	52.05%	58.83%	56.75%	65.02%	51.43%	57.32%	44.87%	48.58%	42.94%	47.85%	44.01%	49.41%
1-Year	0.76%	0.98%	0.70%	1.03%	0.67%	0.91%	0.67%	0.96%	0.49%	1.02%	0.89%	1.24%
2-Year	13.24%	27.05%	13.21%	20.63%	10.93%	29.57%	10.20%	38.44%	9.82%	40.15%	9.54%	38.96%
4-Year	13.24%	11.56%	13.21%	11.56%	10.93%	10.37%	10.20%	10.23%	9.82%	9.34%	9.54%	8.81%
Advanced	1.43%	1.34%	2.13%	1.58%	2.20%	1.67%	2.73%	1.67%	2.40%	1.62%	2.16%	1.59%
Other	0.40%	0.25%	0.36%	0.19%	0.25%	0.15%	0.20%	0.11%	0.08%	0.02%	0	0
STEM CIP	12.38%	3.78%	12.67%	3.71%	11.12%	3.58%	9.33%	3.15%	8.94%	3.21%	8.44%	2.94%
Part Time	72.76%	78.48%	72.69%	80.45%	76.17%	80.61%	74.69%	79.57%	74.08%	80.14%	72.75%	79.21%

	2006		2007		2008		2009		2010		2011	
	M	F	M	F	M	F	M	F	M	F	M	F
Multiple Institutions	2.03%	3.43%	2.09%	3.07%	2.68%	3.23%	2.05%	2.89%	2.15%	2.71%	2.07%	2.41%
Current Age (Mean)	27.24	29.61	27.27	29.66	27.54	29.57	27.94	29.31	27.08	28.75	26.24	28.15
White	59.28%	62.46%	59.07%	62.01%	56.00%	56.92%	59.60%	59.93%	57.26%	56.74%	53.85%	54.55%
US	96.61%	97.25%	96.14%	96.70%	88.42%	89.29%	90.05%	90.32%	92.29%	93.08%	91.06%	92.35%
Utah	80.19%	80.88%	50.12%	48.83%	49.40%	49.44%	62.38%	62.73%	61.30%	61.27%	59.25%	59.55%
Registration Status												
HS	27.47%	30.10%	30.07%	32.32%	29.26%	32.30%	27.15%	32.07%	30.10%	33.25%	30.58%	34.15%
FF (>12)	18.43%	11.75%	15.90%	9.53%	15.09%	8.79%	18.66%	10.66%	16.32%	10.43%	16.05%	9.91%
FH (<12)	10.28%	10.26%	9.74%	9.55%	10.03%	10.38%	11.36%	11.30%	11.29%	11.56%	12.40%	12.75%
NM	21.17%	26.78%	21.86%	27.46%	23.44%	27.75%	21.01%	24.27%	16.07%	17.23%	12.35%	11.63%
TU	8.74%	7.74%	8.89%	8.25%	8.03%	7.58%	9.27%	9.11%	9.66%	9.63%	9.20%	8.52%
RS	2.71%	2.86%	2.61%	2.95%	2.57%	2.95%	2.59%	3.14%	3.49%	3.16%	2.91%	2.87%
CS	8.36%	7.65%	8.74%	8.11%	9.48%	8.59%	6.33%	6.69%	9.86%	10.84%	9.54%	10.29%
Grad	2.34%	2.41%	2.19%	1.82%	2.10%	1.65%	2.27%	2.38%	2.58%	2.04%	2.81%	2.37%
Other	0.49%	0.45%	0	0	0	0	1.35%	03.7%	0.62%	1.86%	4.15%	6.50%
Degree Intent												
Non-Degree	37.44%	44.82%	38.11%	43.82%	42.32%	47.98%	50.67%	53.07%	47.17%	51.14%	46.03%	49.16%
1-Year	0.90%	1.10%	0.61%	1.10%	1.06%	1.12%	1.43%	1.62%	1.95%	1.97%	1.22%	1.28%
2-Year	42.50%	37.61%	41.36%	38.48%	37.93%	36.11%	28.54%	28.52%	29.12%	28.37%	28.11%	27.86%
4-Year	16.37%	14.00%	16.97%	13.65%	16.25%	12.98%	16.97%	14.59%	19.00%	16.32%	21.74%	19.31%
Advanced	2.79%	2.47%	2.95%	2.90%	2.45%	1.81%	2.37%	2.18%	2.73%	2.17%	2.90%	2.38%
Other	0	0	0.01%	0.05%	0	0.01%	0.02%	0.02%	0.02%	0.02%	0.01%	0.01%
STEM CIP	7.86%	2.60%	7.69%	2.26%	7.31%	2.20%	10.36%	2.52%	9.22%	2.74%	10.10%	2.88%
Part Time	73.12%	79.49%	73.60%	79.73%	74.09%	79.91%	72.84%	77.90%	69.53%	75.11%	68.23%	73.84%

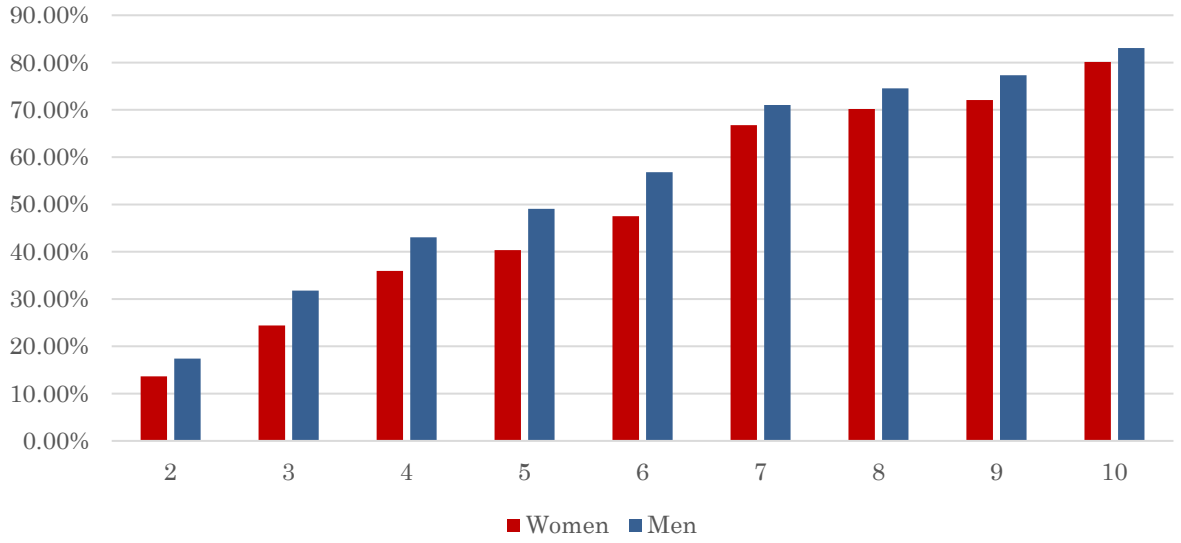
	2012		2013		2014		2015		2016		2017	
	M	F	M	F	M	F	M	F	M	F	M	F
Multiple Institutions	1.93%	2.49%	1.84%	2.44%	2.12%	2.96%	1.95%	2.55%	1.78%	2.15%	2.10%	2.06%
Current Age (Mean)	26.00	27.68	24.96	26.11	24.91	25.73	24.36	25.44	23.95	24.76	23.74	24.59
White	47.66%	48.36%	50.10%	50.94%	51.05%	53.69%	51.21%	52.81%	58.52%	59.66%	65.22%	67.43%
US	91.06%	93.18%	90.48%	92.99%	89.46%	91.85%	91.19%	92.15%	92.42%	94.27%	93.07%	94.39%

Utah	57.54 %	57.50 %	62.65 %	63.02 %	65.06 %	66.67 %	68.69 %	69.77 %	57.12 %	60.05 %	70.88 %	72.73 %
Registration Status												
HS	30.31 %	34.78 %	34.92 %	40.16 %	34.99 %	38.93 %	36.08 %	40.19 %	36.32 %	41.32 %	38.49 %	44.17 %
FF (>12)	15.99 %	10.31 %	19.20 %	12.44 %	15.98 %	9.07%	15.29 %	8.76%	16.36 %	8.39%	15.15 %	7.92%
FH (<12)	12.86 %	13.88 %	11.67 %	12.84 %	13.29 %	17.20 %	14.36 %	17.62 %	14.55 %	18.72 %	16.66 %	19.91 %
NM	10.27 %	9.53%	9.81%	9.58%	9.47%	9.27%	7.81%	7.88%	7.38%	6.95%	6.25%	5.75%
TU	9.33%	9.59%	10.94 %	11.46 %	11.33 %	11.26 %	11.25 %	10.70 %	10.49 %	10.88 %	10.51 %	11.10 %
RS	2.80%	2.86%	2.45%	2.45%	5.77%	5.83%	5.58%	6.03%	4.20%	4.04%	5.45%	4.62%
CS	7.57%	8.23%	5.95%	5.78%	3.74%	3.05%	2.87%	2.65%	4.86%	3.81%	2.19%	1.89%
Grad	2.66%	2.32%	2.85%	2.64%	3.43%	2.88%	3.54%	3.11%	3.57%	3.10%	3.46%	2.72%
Other	8.22%	8.50%	2.21%	2.65%	1.99%	2.51%	3.22%	3.06%	2.27%	2.78%	1.84%	1.93%
Degree Intent												
Non-Degree	44.46 %	47.20 %	40.62 %	44.74 %	39.71 %	42.97 %	38.46 %	41.60 %	38.12 %	41.14 %	37.92 %	41.30 %
1-Year	1.20%	1.10%	0.95%	0.85%	0.72%	0.49%	0.66%	0.40%	0.72%	0.57%	0.87%	0.77%
2-Year	29.96 %	29.78 %	32.58 %	31.29 %	34.68 %	34.14 %	33.89 %	34.84 %	32.12 %	32.65 %	24.74 %	25.97 %
4-Year	21.70 %	19.80 %	23.00 %	20.85 %	21.52 %	19.99 %	23.57 %	20.68 %	25.62 %	23.15 %	25.42 %	22.65 %
Advanced	2.67%	2.12%	2.84%	2.26%	2.75%	2.04%	2.81%	2.10%	2.90%	2.10%	2.894 %	2.08%
Other	0	0.01%	0.01%	0.01%	0.62%	0.36%	0.62%	0.39%	0.51%	0.40%	8.12%	7.23%
STEM CIP	9.89%	2.84%	11.21 %	3.46%	11.77 %	3.80%	12.46 %	4.02%	14.18 %	4.95%	13.53 %	5.01%
Part Time	68.11 %	73.04 %	66.11 %	71.59 %	66.17 %	70.38 %	66.02 %	70.20 %	63.59 %	68.39 %	63.72 %	68.83 %

Stop Out

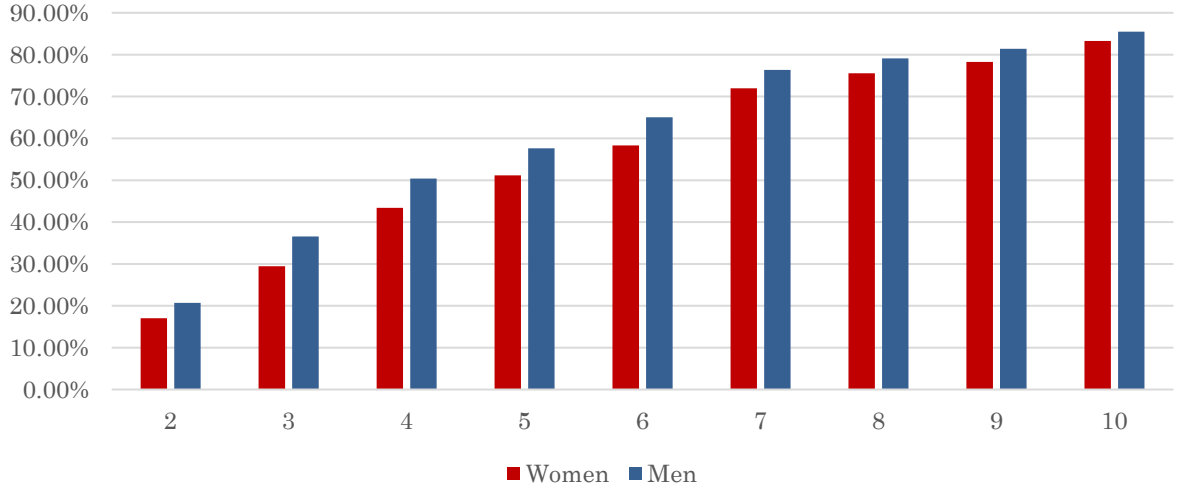
Although we can't identify individual students across terms, we can count the number of terms a student is enrolled starting with their first term in the USHE file and compare that to the total number of terms in the USHE file. Figure 60 shows the percentages of undergraduate male and female students who are seeking a 4-year degree who stop out for 3 or more terms without graduating/completing a degree following each term count. We categorize students as stopping out after at least 3 terms as a conservative estimate so as to not overemphasize students not enrolled in summer terms. For example, for all students who have 6 terms in the USHE student file who are enrolled as undergraduates seeking a 4-year degree and who have not yet graduated, about 48% of women and 57% of men have had a gap of at least 3 terms between their 6th term and their 1st term. For each term of enrollment from 2 to 10, a lower percentage of women have stopped out for at least 3 terms compared to men. The percentage of men and women with a gap of 3+ terms increases with the count of terms enrolled as this group becomes more biased toward students who have not yet graduated but could have.

Figure 60. Undergraduate Men and Women Pursuing a 4-Year Degree with a Gap of 3+ Terms by Number of Terms Enrolled



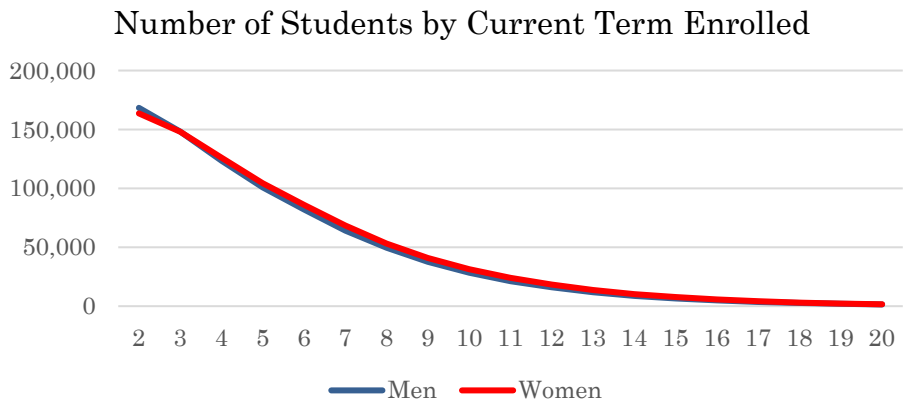
This is similar to the pattern we see among men and women pursuing 2-year degrees, certificates, and diplomas. Table 40 shows that a smaller percentage of women have a gap of 3+ terms compared to men for each count of terms enrolled, and percentages for men and women increase over time as students attrite from the group of enrolled students through graduation.

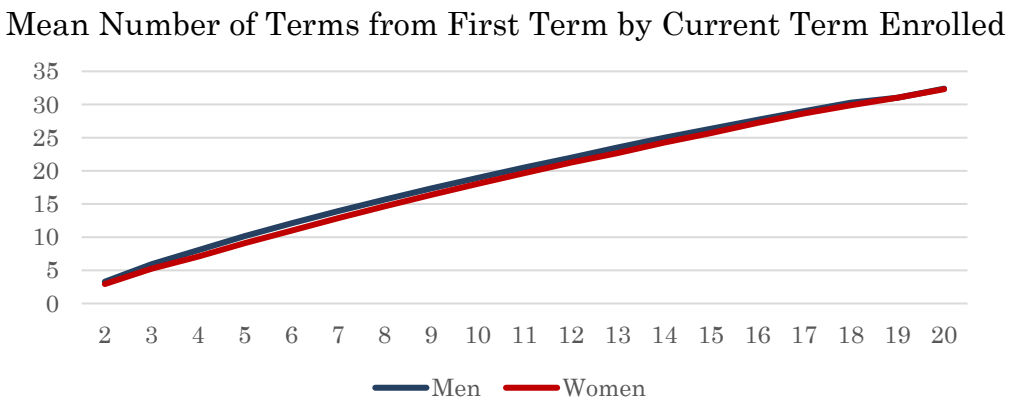
Figure 61. Undergraduate Men and Women Pursuing a 2-Year Degree with a Gap of 3+ Terms by Number of Terms Enrolled

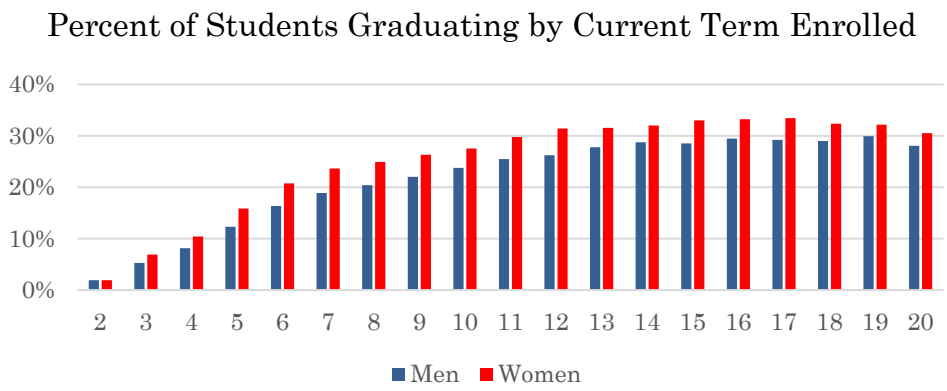


This attrition is shown in Figure 62 (charts for students with a 2-year degree intention) and Figure 63 (charts for students with a 4-year degree intention). The number of men and women who persist decreases over time, leveling off at around 13 terms for 2-year students and 17 terms for 4-year students.

Figure 62. Students Pursuing 2-Year Degrees at USHE Institutions



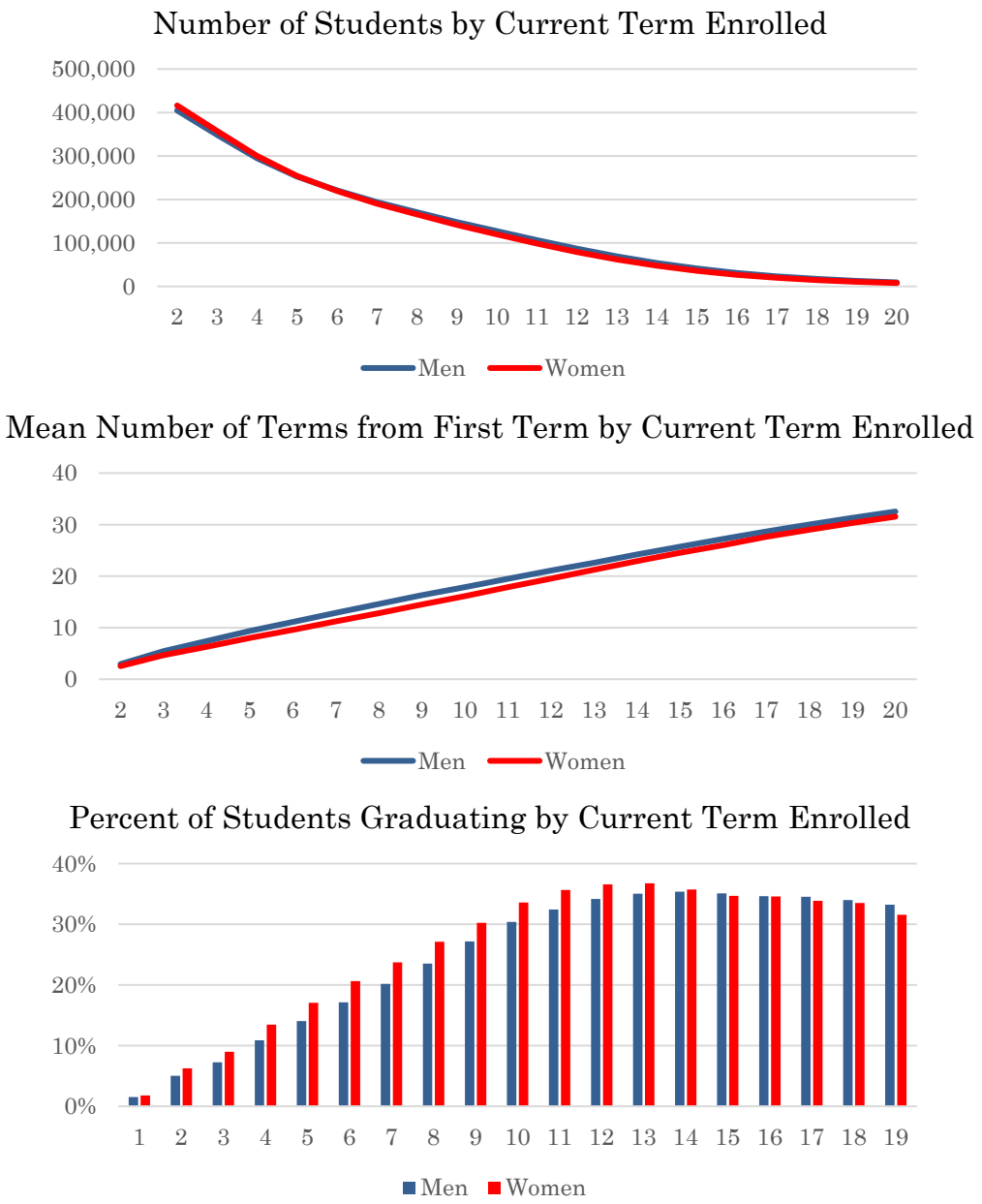




The mean number of terms enrolled by current term enrolled is similar for 2- and 4-year students, suggesting that patterns of enrollment (and stopping out) are similar for both groups. For example, approximately 25-26 terms have passed (on average) for men and women pursuing both 2-year and 4-year degrees who are enrolled in their 15th term, suggesting that about 8 years have passed (at 3 terms per year) since the student's first enrollment and that these students have bypassed enrollment in about 10 of the possible terms they could have enrolled in.

Considering that enrollment drops substantially over summer terms at most institutions, this seems to depict normative persistence.

Figure 63. Students Pursuing 4-Year Degrees at USHE Institutions



We next examine how persistence and graduation vary by time, gender, degree intention, and other student characteristics. Table 13 lists the coefficients from a linear regression analysis predicting student number of terms enrolled. The coefficient for a given variable is interpreted as the amount of change in the number

of terms enrolled given a one-unit increase in the given variable.[43] We see that being female (versus being male) is associated with fewer terms enrolled, as is having a higher start age and reporting no degree intent or up to a 2-year degree intent (e.g., a 1-year certificate or degree and including a 2-year certificate or degree) versus having a 4-year degree intent. Interestingly, attending an institution that offers a bachelor's degree, master's degree, or PhD as its highest degree available is also associated with being enrolled for fewer terms. Being white, being a resident of Utah, attending part time, and pursuing a graduate degree are all associated with a higher number of terms enrolled.

Table 13. Linear Regression Results Predicting Number of Terms Enrolled

Variable	**Coefficient**
Student Characteristics	
Female	-0.20
Age	-0.02
White	0.40
Utah	1.24
GPA	0.10
Part Time	1.07
Nondegree Intent	-3.45
2-Year Degree Intent	-2.28
4-Year Degree Intent	(Reference)
Graduate Degree Intent	4.37
Institution Category	
Associate	(Reference)
Bachelor's	-0.52
Master's	-0.24
PhD	-0.27
Year	
2000	(Reference)
2001	0.81
2002	1.29
2003	1.79
2004	2.33
2005	2.61
2006	2.59
2007	2.71
2008	2.82
2009	2.97

2010	3.03
2011	3.11
2012	3.22
2013	3.37
2014	3.41
2015	3.37
2016	3.22
2017	3.06

In additional analyses (see Appendix E), we found that these associations are different for women and men. We see that women's persistence (being enrolled for a higher number of terms) is associated with having an *older* start age, and there is less advantage of being white for women. Since about 2012, women have been enrolled in fewer terms by year compared to men.

Table 14 lists logistic regression odds ratios depicting the relationship between student and institutional characteristics and graduation. Odds ratios are most easily interpreted by determining whether the number is greater than 1 or less than 1. A value of 1 indicates that there is no difference in the likelihood of the outcome across the values of the variable of interest. For example, if the variable "Female" had an odds ratio of 1 in the model predicting graduation, this would suggest that women are equally as likely to graduate as are men. These results suggest that being female is associated with higher odds of graduating. Being older is associated with lower odds of graduating, while being white, being a Utah resident, and having a higher GPA are associated with higher odds of graduating. Again, most of these relationships are different for men and women (see Appendix E). For men, pursuing a lower-level degree or certificate is associated with a lower likelihood of graduating; the reverse is true for women. For men, pursuing a graduate degree is associated with greater odds of graduating; women pursuing a graduate degree are less likely to graduate. And while men and women are more likely to graduate in recent years versus in earlier years, this is more true for women.

Table 14. Logistic Regression Predicting Graduation

Variable	**Odds Ratio**
Student Characteristics	
Female	1.08
Age	0.99
White	1.20
Utah	1.14
GPA	1.57
Part Time	0.99
Nondegree Intent	1.60
2-Year Degree Intent	0.64

4-Year Degree Intent	(Reference)
Graduate Degree Intent	1.37
Institution Category	
Associate	(Reference)
Bachelor's	1.62
Master's	1.24
PhD	1.25
Year	
2000	(Reference)
2001	1.12
2002	1.03
2003	1.02
2004	1.08
2005	1.08
2006	1.07
2007	1.00
2008	1.08
2009	1.07
2010	1.05
2011	1.04
2012	1.08
2013	1.08
2014	1.17
2015	1.15
2016	1.19
2017	1.30

Conclusion

In this section we have used USHE student data to explore the demographic and educational characteristics of men and women in USHE institutions. Women tend to make up a bigger proportion of students who enroll more than 12 months after high school, and they represent a bigger proportion of freshmen and sophomore students. Women generally represent smaller proportions of graduate students (except for at SUU), and they tend to be younger than men at the same enrollment level.

Once they begin postsecondary education, women tend to "stop out" less often than men. While most students have a gap of 3+ terms once they have been enrolled for 7 terms, a higher proportion of men are in this category. Women are also more likely

to graduate after having attended fewer terms compared to men up to about 14 terms enrolled, likely reflecting women's pursuit of shorter degrees.

As we have shown in other sections, men and women pursue gendered fields of study, with men having higher participation in fields like engineering and business, and women having higher participation in fields like education. However, our USHE analyses show that in most institutions the distribution of men and women across fields of study is becoming more diverse over time.

Finally, we find that different factors are associated with persistence and completion for men and women. While we cannot account for what is driving those differences in this section, findings in previous sections provide plausible hypotheses.

Section 4: Conclusion

In the introduction we listed the 5 questions we used to guide this research.

Research Questions

1. How can we characterize the higher education context in Utah for men and women, and how has this changed over time?
2. How does women's postsecondary educational attainment in Utah compare to women's postsecondary educational attainment in the US? How has this changed over time?
3. What is the extent of women's educational attainment in Utah, including field of study, level, and institution?
4. What is the life course of students pursuing postsecondary certificates and degrees in Utah? What are the factors associated with persistence and completion?
5. How can we explain and reconcile different results from different data sources?

We found that the higher education context in Utah for men and women is robust. In 2015, educational attainment for men and women ages 25+ in Utah matched or exceeded national postsecondary attainment up through a bachelor's degree, and over 60% of this group has attained at least some college. Some postsecondary education patterns have remained stable over time, and some have changed. In recent years the gap between men's and women's bachelor's degree attainment in the Utah population has been eliminated, but there are still gender-based educational disparities. Women continue to outnumber men in the some college and associate degree levels, and more men hold graduate degrees. Because of these differences, the proportion of Utah women holding at least a bachelor's degree continues to be lower compared to men. We also see that men and women experience different timing in educational attainment and different associations between family formation and educational attainment.

Compared to women in the US, women in Utah have lower cumulative attainment in the regular population and lower enrollment in the student population. This gap is narrowing over time, but it is part of why Utah gets national attention for being ranked lower on measures of women's educational well-being. Utah women stop their educational attainment at lower levels compared to US women, and they make up a smaller proportion of enrollment compared to US women and women in other states (though the actual difference between Utah enrollment and national enrollment is becoming smaller over time). Additionally, a smaller proportion of women in Utah pursue degrees in STEM-oriented fields compared to women in the US. Concentration of women in lower-paying fields of study likely influences future wages, further influencing Utah women's economic well-being relative to the rest of

the nation. A greater proportion of Utah women complete shorter degrees (less than a bachelor's degree) within 150% of normal time compared to US women, but in recent years Utah women's completion of bachelor's degrees within this limit has lagged (perhaps due in part to the change in the LDS mission age for women).

We also found that students at USHE institutions follow a variety of paths. On average, women are at an older age in their first term compared to men, and a smaller proportion of women experience gaps of 3 or more terms as they progress toward a degree compared to men. Women pursue and earn a greater proportion of degrees below a bachelor's degree, and they are less likely to earn a STEM degree. The USHE data do not capture family formation behavior or labor force participation, but we expect that these patterns we see in this section are associated with those activities.

Throughout this report we have emphasized that each of the three datasets provides a different perspective on postsecondary educational activities. With the ACS data, we looked at the extent of these activities in the population. This is our best characterization of Utah as a whole, because these data include students and nonstudents. With the IPEDS data, we looked at institutional responses to standardized questions that are asked over time, and we compared responses from Utah institutions with responses from US institutions. These data provided a way for us to make accurate comparisons among different institutions. The USHE data provide a more in-depth view of student characteristics at most institutions in Utah. When combined, results from these datasets provide a holistic depiction of the state of postsecondary education in Utah. Independently, each provides a specific perspective and application. We encourage anyone interested in postsecondary educational activities in Utah to consider the source for research and reports, and to exercise caution when comparing different reports or statistics.

Appendix A: Education Questions in the American Community Survey

School Attendance

At any time IN THE LAST 3 MONTHS, has this person attended school or college? *Include only nursery or preschool, kindergarten, elementary school, home school, and schooling which leads to a high school diploma or a college degree.*

- No, has not attended in the last 3 months
- Yes, public school, public college
- Yes, private school, private college, home school

Grade Attending [Only students who are currently attending]

What grade or level was this person attending?

- Nursery school, preschool
- Kindergarten
- Grade 1 through 12 [specific grade level listed]
- College undergraduate years (freshman to senior)
- Graduate or professional school beyond a bachelor's degree *(for example: MA or PhD program, or medical or law school)*

Educational Attainment

What is the highest degree or level of school this person has COMPLETED?

- No schooling completed
- Elementary school [specific grade level listed]*
- High school or GED*
- Some college credit, but less than 1 year of college credit
- 1 or more years of college credit, no degree
- Associate's degree *(for example: AA, AS)*
- Bachelor's degree *(for example: BA, BS)*
- Master's degree *(for example: MA, MS, MEng, MEd, MSW, MBA)*
- Professional degree beyond a bachelor's degree *(for example: MD, DDS, DVM, LLB, JD)*
- Doctorate degree *(for example: PhD, EdD)*

Degree Field

This question focuses on this person's BACHELOR'S DEGREE. Please print below the specific major(s) of any BACHELOR'S DEGREES this person has received. *(For example: chemical engineering, elementary teacher education, organizational psychology)*

- [Specific degree listed]**

* Different grade options for 2001-2007 and 2008-2015

** Only available for 2009-2015

Appendix B: Selected Regression Results

Results for Table 4:

Logistic Regression Odds Ratios Predicting Enrollment in Postsecondary Education in Past 3 Months for Utah Adults Ages 25-34

	Model 1	**Model 2**	**Model 3**	**Model 4**	**Model 5**	**Model 6**	**Model 7**
Female (0,1)	0.58***	0.60***	0.99	1.01	1.03	1.02	0.60***
Hispanic origin (0,1)	0.50***	0.49***	0.49***	0.49***	0.49***	0.41***	0.41***
Age	0.86***	0.86***	0.86***	0.86***	0.86***	0.86***	0.86***
Age^2	1.01**	1.01*	1.01*	1.00	1.00	1.00	1.00
Born out of Utah (0,1)						1.34***	1.35***
In poverty (0,1)						1.54***	1.49***
Married (0,1)		0.83***	1.18**	1.51***	1.36***	1.46***	1.51***
xFemale			0.40***	0.40***	0.50***	0.48***	0.48***
Never married (omitted)	--	--	--	--	--	--	--
Div/sep or widowed (0,1)		0.83*	0.69**	0.70**	0.70**	0.71*	0.72*
xFemale			1.20	1.28	1.35	1.33	1.30
Kids under 5 in home (0,1)				0.64***	0.78***	0.78***	0.80***
xFemale					0.63***	0.58***	0.61***
Labor force participation						0.78***	0.53***
xFemale							1.92***
2005 (omitted)	--	--		--	--	--	
2006	1.01	1.01	1.02	1.02	1.02	1.02	1.01
2007	0.92	0.92	0.93	0.92	0.92	0.92	0.92
2008	1.04	1.03	1.04	1.04	1.04	1.04	1.04
2009	1.07	1.05	1.06	1.05	1.05	1.05	1.05
2010	1.10	1.09	1.10	1.10	1.10	1.08	1.08
2011	1.16	1.15	1.17	1.16	1.16	1.14	1.14
2012	1.19*	1.16	1.18	1.17	1.17	1.17	1.17
2013	1.12	1.11	1.12	1.12	1.12	1.09	1.08
2014	1.07	1.05	1.06	1.06	1.06	1.04	1.04
2015	0.95	0.93	0.94	0.92	0.92	0.91	0.91

Constant	0.21	0.24	0.20	0.20	0.20	0.21	0.28
F* **	81.09	73.98	82.16	83.90	74.71	67.39	68.06

* alpha 0.05, ** alpha 0.01, *** alpha 0.001
Subpop N = 42,475; Subpop size = 4,805,924
All models include a control (not statistically significant) for residence in noninstitutional group quarters.
Age is centered around the mean age in this age group to reduce collinearity with age^2.
Age^2 is a squared term (quadratic term) to check for a curvilinear relationship.
Interaction terms between female and being born out of Utah | female and being in poverty were not statistically significant in iterations of the final model and in the 5-year sample model and so were dropped.

Appendix C: Stata Commands

Setting up data for survey design (years 2005-2015):

```
svyset[pweight=perwt], vce(brr) brrweight(repwtp1-repwtp80) fay(.5)mse
```

(see "Replicate Weights in the American Community Survey / Puerto Rican Community Survey" at https://usa.ipums.org/usa/repwt.shtml)

Using the "subpop" command allows for the information from all cases to be used with the replicate weights while limiting the estimates themselves to only the subpopulation (i.e., adults 25 and up). This command is used in most analyses for the years 2005-2015 (the years with replicate weights) to isolate certain age groups.

Table 1:

For each year, 2001-2004:

```
tab female agecat4 if statefip== 49 & ages18andup==1 & enrolledincoll==1
[aweight=perwt], col

tab female agecat4 if ages18andup==1 & enrolledincoll==1 [aweight=perwt], col
```

To determine statistical significance:

```
foreach i of num 2001/2004 {
glm enrolledincoll female if year==`i' & ages18andup==1 [aweight=perwt],
link(logit)
}
```

For each year, 2005-2015:

```
svy:tab enrolledincoll female if statefip==49, subpop(ages18andup) col

svy:tab enrolledincoll female, subpop(ages18andup) col
```

To determine statistical significance:

```
foreach i of num 2005/2015 {
svy, subpop(if ages18andup==1):logistic enrolledincoll female i.agecat4##female if
year==`i', or
}
```

Table 2:

For each year, 2001-2004:

```
tab newedcat agecat4 if statefip== 49 & ages18andup==1 & female==0
[aweight=perwt], col
tab newedcat agecat4 if statefip== 49 & ages18andup==1 & female==1
[aweight=perwt], col

tab newedcat agecat4 if ages18andup==1 & female==0 [aweight=perwt], col
tab newedcat agecat4 if ages18andup==1 & female==1 [aweight=perwt], col
```

To determine statistical significance:

```
foreach i of num 2001/2004 {
glm enrolledincoll female if year==`i' & agecats1==1 [aweight=perwt], link(logit)
}
foreach i of num 2001/2004 {
glm enrolledincoll female if year==`i' & agecats2==1 [aweight=perwt], link(logit)
}
foreach i of num 2001/2004 {
glm enrolledincoll female if year==`i' & agecats3==1 [aweight=perwt], link(logit)
}
```

For each year, 2005-2015:

```
svy:tab newedcat agecat4 if statefip==49, subpop(ages18andup if female==0) col
svy:tab newedcat agecat4 if statefip==49, subpop(ages18andup if female==1) col

svy:tab newedcat agecat4, subpop(ages18andup if female==0) col
svy:tab newedcat agecat4, subpop(ages18andup if female==1) col
```

To determine statistical significance:

```
foreach i of num 2005/2015 {
svy, subpop(if agecats1==1):logistic enrolledincoll female if year==`i', or
}
foreach i of num 2005/2015 {
svy, subpop(if agecats2==1):logistic enrolledincoll female if year==`i', or
}
foreach i of num 2005/2015 {
svy, subpop(if agecats3==1):logistic enrolledincoll female if year==`i', or
}
```

Table 3:

Variables were entered stepwise (see Appendix B), and final model (below) was estimated after model fitting.

```
svy, subpop(agecats2):logistic enrolledincoll female hisporigin mage25to34
mage25to342 married femarr divsepwid fedivsepwid kidsunder5 fekidsunder5
inpoverty laborforce felaborforce boututah y6 y7 y8 y9 y10 y11 y12 y13 y14 y15 if
year>=2005, or
```

We then used the logit command to obtain coefficients instead of odds ratios. We solved the regression equation terms for men and women and exponentiated the values to find the amount of change in the odds of enrollment associated with each characteristic.

Table 4:

Given values were changed as needed. Command was performed after the final model for Table 3.

```
margins, at(female==0 hisporigin==0 mage25to34==0 mage25to342==0 married==0
femarr==0 divsepwid==0 fedivsepwid==0 kidsunder5==0 fekidsunder5==0
inpoverty==0 laborforce==0 felaborforce==0 boututah==0) subpop(agecats2)
```

Table 5:

Variables were entered stepwise to find the final model.

```
svy, subpop(if enrolledincoll==1):logistic gradschool female hisporigin
meanage25andup meanage25andup2 married divsepwid  kidsunder5 fekidsunder5
```

Table 7:

```
foreach i of num 2001/2004 {
tab onlysomecoll female if year==`i' & age>=25 [aweight=perwt], col
}

foreach i of num 2005/2015 {
svy, subpop(if age>=25):tab onlysomecoll female if year==`i', col
}
```

Table 8:

```
svy, subpop(ages25andup):mlogit fewedcat female hisporigin meanage25andup
meanage25andup2 laborforce felaborforce boututah inpoverty married femarr
divsepwid fedivsepwid kidsunder5 fekidsunder5 noninstitutional, rrr
```

Table 9:

```
foreach i of num 2001/2004 {
tab onlysomecoll female if year==`i' & age>=25 [aweight=perwt], col
}

foreach i of num 2005/2015 {
svy, subpop(if age>=25):tab onlysomecoll female if year==`i', col
}
```

Tables 5-8

For each attainment category:

```
foreach i of num 2001/2004 {
tab onlysomecoll female if year==`i' & age>=25 [aweight=perwt], col
}

foreach i of num 2005/2015 {
svy, subpop(if age>=25):tab onlysomecoll female if year==`i', col
}
```

To determine statistical significance:

For each attainment category:

```
foreach i of num 2001/2004 {
glm onlysomecoll female if year==`i' & age>=25 [aweight=perwt], link(logit)
}

foreach i of num 2005/2015 {
svy, subpop(if age>= 25):logistic onlysomecoll female if year==`i', or
}
```

These results were not substantively different when we accounted for residence in group quarters.

Table women graduate degrees

Years 2001-2004:

```
tab newedcat agecat4 if statefip== 49 & ages18andup==1 & female==0
[aweight=perwt], col
tab newedcat agecat4 if statefip== 49 & ages18andup==1 & female==1
[aweight=perwt], col

tab newedcat agecat4 if ages18andup==1 & female==0 [aweight=perwt], col
tab newedcat agecat4 if ages18andup==1 & female==1 [aweight=perwt], col
```

Years 2005-2015:

```
svy:tab enrolledincoll agecat4 if statefip==49, subpop(ages18andup if female==0) col
svy:tab enrolledincoll agecat4 if statefip==49, subpop(ages18andup if female==1) col

svy:tab enrolledincoll agecat4, subpop(ages18andup if female==0) col
svy:tab enrolledincoll agecat4, subpop(ages18andup if female==1) col
```

To determine statistical significance:

```
foreach i of num 2001/2004 {
glm onlybach female if year==`i' & age>=25 [aweight=perwt], link(logit)
}

foreach i of num 2005/2015 {
svy, subpop(if onlybach!=. & age>=25):logistic onlybach female gquarter if year==`i',
or
}
```

Appendix D: SQL Queries

```
DROP TABLE #SID_YEAR_TERM;
SELECT S_ID,
        S_YEAR,
        S_TERM,
        MIN(CONCAT(S_YEAR,' ',S_TERM)) AS YEAR_TERM
INTO #SID_YEAR_TERM
FROM PRODUCTION.DBO.STUDENTS
        WHERE S_EXTRACT = 'E'
GROUP BY S_ID, S_YEAR, S_TERM;

DROP TABLE #TERMNUM;
SELECT DISTINCT YEAR_TERM,
ROW_NUMBER() OVER(ORDER BY YEAR_TERM ASC) AS YEAR_TERM_NUM
INTO #TERMNUM
FROM #SID_YEAR_TERM
GROUP BY YEAR_TERM;


DROP TABLE #PERSONTERMNUM;
SELECT S_ID,
        YEAR_TERM,
        ROW_NUMBER() OVER (PARTITION BY S_ID ORDER BY YEAR_TERM ASC)
        AS PERSON_TERM_COUNT
INTO #PERSONTERMNUM
FRO
M (
        SELECT S_ID,
                        YEAR_TERM
        FROM #SID_YEAR_TERM
        GROUP BY S_ID, YEAR_TERM
        ) A ;



DROP TABLE #FIRSTYEARTERM;
SELECT S_ID,
        MIN(CONCAT(S_YEAR,' ',S_TERM)) AS FIRST_YEAR_TERM
INTO #FIRSTYEARTERM
FROM PRODUCTION.dbo.STUDENTS
        WHERE S_EXTRACT = 'E'
GROUP BY S_ID;
```

```
DROP TABLE #CURRINSTS;
SELECT A.S_ID,
        A.YEAR_TERM,
        COUNT(STU.S_INST) AS CURR_MULT_INST_FLAG
INTO #CURRINSTS
FROM #SID_YEAR_TERM A
LEFT JOIN PRODUCTION.DBO.STUDENTS STU
        ON A.S_ID = STU.S_ID
        AND A.YEAR_TERM = CONCAT(STU.S_YEAR,' ',STU.S_TERM)
WHERE S_EXTRACT = 'E'
GROUP BY A.S_ID, A.YEAR_TERM;

DROP TABLE #STARTS;
SELECT A.S_ID,
        A.FIRST_YEAR_TERM,
        (SELECT TOP 1 STU.S_AGE FROM PRODUCTION.DBO.STUDENTS STU
                        WHERE STU.S_ID = A.S_ID
                        AND CONCAT(STU.S_YEAR,' ',STU.S_TERM) =
                        A.FIRST_YEAR_TERM
                        AND S_EXTRACT = 'E'
                        --AND S_REG_STATUS IN ('FH','FF')
                        GROUP BY STU.S_AGE
                        ORDER BY COUNT(*) DESC) AS START_AGE,
        (SELECT TOP 1 STU.S_GENDER FROM PRODUCTION.DBO.STUDENTS STU
                        WHERE STU.S_ID = A.S_ID
                        AND CONCAT(STU.S_YEAR,' ',STU.S_TERM) =
                        A.FIRST_YEAR_TERM
                        AND S_EXTRACT = 'E'
                        --AND S_REG_STATUS IN ('FH','FF')
                        GROUP BY STU.S_GENDER
                        ORDER BY COUNT(*) DESC) AS START_GENDER,
        (SELECT TOP 1
        (CONCAT(S_ETHNIC_H,S_ETHNIC_A,S_ETHNIC_B,S_ETHNIC_P,S_ETHNIC_
        W,S_ETHNIC_N,S_ETHNIC_U))
                        FROM PRODUCTION.DBO.STUDENTS STU
                        WHERE STU.S_ID = A.S_ID
                        AND CONCAT(STU.S_YEAR,' ',STU.S_TERM) =
                        A.FIRST_YEAR_TERM
                        AND S_EXTRACT = 'E'
                        --AND S_REG_STATUS IN ('FH','FF')
                        GROUP BY
                        CONCAT(S_ETHNIC_H,S_ETHNIC_A,S_ETHNIC_B,S_ETHNIC_
                        P,S_ETHNIC_W,S_ETHNIC_N,S_ETHNIC_U)
```

```
                ORDER BY COUNT(*) DESC) AS START_ETH,
(SELECT TOP 1 STU.S_ETHNIC_IPEDS FROM
PRODUCTION.DBO.STUDENTS STU
                WHERE STU.S_ID = A.S_ID
                AND CONCAT(STU.S_YEAR,' ',STU.S_TERM) =
                A.FIRST_YEAR_TERM
                AND S_EXTRACT = 'E'
                --AND S_REG_STATUS IN ('FH','FF')
                GROUP BY STU.S_ETHNIC_IPEDS
                ORDER BY COUNT(*) DESC) AS START_ETHNIC_IPEDS,
(SELECT TOP 1 STU.S_ACT FROM PRODUCTION.DBO.STUDENTS STU
                WHERE STU.S_ID = A.S_ID
                AND CONCAT(STU.S_YEAR,' ',STU.S_TERM) =
                A.FIRST_YEAR_TERM
                AND S_EXTRACT = 'E'
                --AND S_REG_STATUS IN ('FH','FF')
                GROUP BY STU.S_ACT
                ORDER BY COUNT(*) DESC) AS START_ACT,
(SELECT TOP 1 STU.S_COUNTRY_ORIGIN FROM
PRODUCTION.DBO.STUDENTS STU
                WHERE STU.S_ID = A.S_ID
                AND CONCAT(STU.S_YEAR,' ',STU.S_TERM) =
                A.FIRST_YEAR_TERM
                AND S_EXTRACT = 'E'
                --AND S_REG_STATUS IN ('FH','FF')
                GROUP BY STU.S_COUNTRY_ORIGIN
                ORDER BY COUNT(*) DESC) AS START_COUNTRY_ORIGIN,
(SELECT TOP 1 STU.S_COUNTY_ORIGIN FROM
PRODUCTION.DBO.STUDENTS STU
                WHERE STU.S_ID = A.S_ID
                AND CONCAT(STU.S_YEAR,' ',STU.S_TERM) =
                A.FIRST_YEAR_TERM
                AND S_EXTRACT = 'E'
                --AND S_REG_STATUS IN ('FH','FF')
                GROUP BY STU.S_COUNTY_ORIGIN
                ORDER BY COUNT(*) DESC) AS START_COUNTY_ORIGIN,
(SELECT TOP 1 STU.S_STATE_ORIGIN FROM
PRODUCTION.DBO.STUDENTS STU
                WHERE STU.S_ID = A.S_ID
                AND CONCAT(STU.S_YEAR,' ',STU.S_TERM) =
                A.FIRST_YEAR_TERM
                AND S_EXTRACT = 'E'
                --AND S_REG_STATUS IN ('FH','FF')
                GROUP BY STU.S_STATE_ORIGIN
                ORDER BY COUNT(*) DESC) AS START_STATE_ORIGIN,
```

```
        (SELECT TOP 1 (CAST(LEFT(STU.S_HS_GRAD_DATE,4) AS INT))
                        FROM PRODUCTION.DBO.STUDENTS STU
                        WHERE STU.S_ID = A.S_ID
                        AND CONCAT(STU.S_YEAR,' ',STU.S_TERM) =
                        A.FIRST_YEAR_TERM
                        AND S_EXTRACT = 'E'
                        --AND S_REG_STATUS IN ('FH','FF')
                        GROUP BY CAST(LEFT(STU.S_HS_GRAD_DATE,4) AS INT)
                        ORDER BY COUNT(*) DESC) AS START_HSGRADYEAR
INTO #STARTS
FROM #FIRSTYEARTERM A
GROUP BY A.S_ID, A.FIRST_YEAR_TERM ;

DROP TABLE #NAMECHANGE_2;
SELECT B.S_ID,
        B.YEAR_TERM,
        LAG(B.MODE_LAST_NAME) OVER (PARTITION BY B.S_ID ORDER BY
        B.YEAR_TERM ASC) AS PREV_LASTNAME,
        B.MODE_LAST_NAME
INTO #NAMECHANGE_2
FRO
M (
        SELECT A.S_ID,
                        A.YEAR_TER
                        M,
                        (SELECT TOP 1 STU.S_LAST FROM
                        PRODUCTION.DBO.STUDENTS STU
                                WHERE STU.S_ID = A.S_ID
                                AND CONCAT(STU.S_YEAR,' ',STU.S_TERM) =
                                A.YEAR_TERM
                                AND S_EXTRACT = 'E'
                                GROUP BY STU.S_LAST
                                ORDER BY COUNT(*) DESC) AS MODE_LAST_NAME
        FROM #SID_YEAR_TERM A
        GROUP BY A.S_ID, A.YEAR_TERM) B;

DROP TABLE #NAMECHANGE;
SELECT C.S_ID,
        C.YEAR_TERM,
        CASE WHEN PREV_LASTNAME <> MODE_LAST_NAME AND
        PREV_LASTNAME IS NOT NULL THEN 1 ELSE 0 END AS NAMECHANGE
INTO #NAMECHANGE
FROM #NAMECHANGE_2 C;
```

```
DROP TABLE #PERSON_TERM_FILE;
SELECT TN.YEAR_TERM_NUM,
        CASE WHEN PTN.YEAR_TERM IS NOT NULL THEN 1 ELSE 0 END AS
        CURR_ENROLLED,
        STU.S_ID,
        STU.S_YEAR,
        STU.S_TERM,
        CONCAT(STU.S_YEAR,' ',STU.S_TERM) AS CURR_YEAR_TERM,
        PTN.PERSON_TERM_COUNT,
        FYT.FIRST_YEAR_TERM,
        CASE WHEN (CONCAT(STU.S_YEAR,' ',STU.S_TERM)) =
        FYT.FIRST_YEAR_TERM AND CURR_MULT_INST_FLAG > 1 THEN 1 ELSE 0
        END AS FIRST_MULT_INST_FLAG,
        CMULT.CURR_MULT_INST_FLAG,
        ST.START_AGE,
        ST.START_GENDER,
        ST.START_ETH,
        ST.START_ACT,
        ST.START_ETHNIC_IPEDS,
        ST.START_COUNTRY_ORIGIN,
        ST.START_COUNTY_ORIGIN,
        ST.START_STATE_ORIGIN,
        ST.START_HSGRADYEAR,
        NC.NAMECHANGE,
        STU.S_AGE AS CURR_AGE,
        STU.S_REGENT_RES AS CURR_REGENT_RES,
        STU.S_REG_STATUS AS CURR_REG_STATUS,
        LEFT(STU.S_CURR_CIP,2) AS CURR_CIP,
        S_CUM_GPA_UGRAD,
        S_CUM_HRS_UGRAD,
        S_CUM_HRS_GRAD,
        S_CUM_GPA_GRAD,
        S_LEVEL,
        S_DEG_INTENT,
        S_PT_FT,
        S_COLLEGE,
        S_MAJOR,
        S_COLLEGE2,
        S_MAJOR2,
        S_TERM_ATT_CR,
        S_TERM_EARNED_CR,
        S_HB75_WAIVER,
```

```
        S_TERM_GPA,
        S_INAME,
        CASE WHEN G_INST IS NOT NULL THEN 1 ELSE 0 END AS GRADFLAG,
        G_INST,
        CAST(LEFT(G_CIP,2) AS INT) AS GRAD_CIP,
        G_DEG_TYPE,
        G_GPA,
        G_IPEDS
INTO #PERSON_TERM_FILE
FROM PRODUCTION.DBO.STUDENTS STU
LEFT JOIN #TERMNUM TN
        ON CONCAT(STU.S_YEAR,' ',STU.S_TERM) = TN.YEAR_TERM
LEFT JOIN #PERSONTERMNUM PTN
        ON CONCAT(STU.S_YEAR,' ',STU.S_TERM) = PTN.YEAR_TERM
        AND STU.S_ID = PTN.S_ID
LEFT JOIN #FIRSTYEARTERM FYT
        ON STU.S_ID = FYT.S_ID
LEFT JOIN #CURRINSTS CMULT
        ON CONCAT(STU.S_YEAR,' ',STU.S_TERM) = CMULT.YEAR_TERM
        AND STU.S_ID = CMULT.S_ID
LEFT JOIN #STARTS ST
        ON FYT.FIRST_YEAR_TERM = ST.FIRST_YEAR_TERM
        AND FYT.S_ID = ST.S_ID
LEFT JOIN #NAMECHANGE NC
        ON STU.S_ID = NC.S_ID
        AND CONCAT(STU.S_YEAR,' ',STU.S_TERM) = NC.YEAR_TERM
LEFT JOIN PRODUCTION.DBO.GRADUATION GRAD
        ON STU.S_ID = GRAD.G_ID
        AND STU.S_YEAR = GRAD.G_YEAR
WHERE STU.S_EXTRACT = 'E'
;
```

Appendix E: Model Outputs for Section 3

```
. regress person_term_count female start_age_b festartage start_eth_white fewhite sta
> rt_state_origin_ut feutah nugradgpa fegpa parttime feparttime i.nsinst i.feinst i.s
> _year i.feyear uptotwoyear feupto2 graddeg fegrad nondegree fenondeg intentother fe
> intother if gradflag == 0, baselevels
note: 5.feinst omitted because of collinearity
note: 2017.feyear omitted because of collinearity
```

Source	SS	df	MS
Model	14559155	61	238674.671
Residual	69737848.8	4,601,066	15.1568895
Total	84297003.8	4,601,127	18.320947

Number of obs	= 4,601,128
F(61, 4601066)	= 15746.94
Prob > F	= 0.0000
R-squared	= 0.1727
Adj R-squared	= 0.1727
Root MSE	= 3.8932

person_term_count	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
female	-.4617552	.0233131	-19.81	0.000	-.5074481	-.4160624
start_age_b	-.0235612	.0003874	-60.82	0.000	-.0243205	-.0228019
festartage	.0069487	.0005043	13.78	0.000	.0059602	.0079371
start_eth_white	.4292126	.005955	72.08	0.000	.417541	.4408843
fewhite	-.0633877	.0084561	-7.50	0.000	-.0799613	-.0468141
start_state_orig~t	1.266252	.0063348	199.89	0.000	1.253836	1.278668
feutah	-.0470315	.0090719	-5.18	0.000	-.0648121	-.0292509
nugradgpa	.1122409	.0019663	57.08	0.000	.1083871	.1160947
fegpa	-.0147019	.0028591	-5.14	0.000	-.0203056	-.0090981
parttime	1.128909	.005506	205.03	0.000	1.118118	1.139701
feparttime	-.1285155	.0080102	-16.04	0.000	-.1442152	-.1128158
nsinst						
1. ASSO	0	(base)				
2. BACH	-.4897895	.0090048	-54.39	0.000	-.5074386	-.4721404
3. MASTERS	-.3503811	.0084114	-41.66	0.000	-.3668673	-.333895
4. NULL	-.9985484	.02311	-43.21	0.000	-1.043843	-.9532535
5. PHD	-.302657	.0095307	-31.76	0.000	-.3213368	-.2839771
feinst						
0	0	(base)				
1	-.0389999	.0133738	-2.92	0.004	-.0652121	-.0127877
2	-.1010514	.0139272	-7.26	0.000	-.1283482	-.0737546
3	.1479909	.0097516	15.18	0.000	.1288781	.1671036
4	.0755764	.0327233	2.31	0.021	.01144	.1397129
5	0	(omitted)				
s_year						
2000	0	(base)				
2001	.7930711	.0180479	43.94	0.000	.7576979	.8284444
2002	1.258303	.0171817	73.23	0.000	1.224627	1.291978
2003	1.797685	.0169045	106.34	0.000	1.764553	1.830818
2004	2.37675	.0171195	138.83	0.000	2.343196	2.410303
2005	2.679094	.0171095	156.59	0.000	2.64556	2.712629
2006	2.659909	.0173613	153.21	0.000	2.625882	2.693937
2007	2.766646	.0174339	158.69	0.000	2.732476	2.800815
2008	2.869108	.0175777	163.22	0.000	2.834656	2.90356
2009	3.016549	.0172674	174.70	0.000	2.982705	3.050392
2010	3.078878	.0168572	182.64	0.000	3.045838	3.111917
2011	3.180735	.0167015	190.45	0.000	3.148001	3.213469
2012	3.304431	.0166817	198.09	0.000	3.271735	3.337126
2013	3.457856	.0167687	206.21	0.000	3.42499	3.490722
2014	3.548263	.0168769	210.24	0.000	3.515185	3.581341
2015	3.518807	.0169648	207.42	0.000	3.485557	3.552058
2016	3.307845	.0169506	195.15	0.000	3.274622	3.341067
2017	3.134601	.0169544	184.88	0.000	3.101371	3.16783
feyear						
0	0	(base)				
2000	.1675058	.0240456	6.97	0.000	.1203773	.2146342
2001	.2154792	.0233513	9.23	0.000	.1697114	.261247
2002	.2450033	.0219485	11.16	0.000	.2019851	.2880215
2003	.1566895	.0214232	7.31	0.000	.1147009	.1986782
2004	.0741366	.0217925	3.40	0.001	.0314242	.1168491
2005	.0308347	.0217119	1.42	0.156	-.0117198	.0733892
2006	.0117891	.0220573	0.53	0.593	-.0314425	.0550207
2007	.0469031	.0221065	2.12	0.034	.0035751	.0902311
2008	.0712064	.0221002	3.22	0.001	.0278908	.1145219
2009	.0732573	.0215263	3.40	0.001	.0310665	.1154482
2010	.0683867	.0207852	3.29	0.001	.0276484	.109125
2011	.0210337	.0204652	1.03	0.304	-.0190774	.0611448
2012	-.0081929	.0203764	-0.40	0.688	-.0481298	.031744
2013	-.0179551	.0205003	-0.88	0.381	-.0581349	.0222246
2014	-.1182757	.0206688	-5.72	0.000	-.1587858	-.0777656
2015	-.1472847	.020763	-7.09	0.000	-.1879794	-.10659
2016	-.0269244	.0207034	-1.30	0.193	-.0675024	.0136537
2017	0	(omitted)				
uptotwoyear	-2.520901	.0078631	-320.60	0.000	-2.536312	-2.505489
feupto2	.4849704	.011111	43.65	0.000	.4631933	.5067476
graddeg	4.521466	.0303696	148.88	0.000	4.461942	4.580989
fegrad	-.3047762	.0438578	-6.95	0.000	-.390736	-.2188165
nondegree	-3.705584	.009045	-409.68	0.000	-3.723312	-3.687856
fenondeg	.5212225	.0125663	41.48	0.000	.496593	.545852
intentother	-.046758	.0405419	-1.15	0.249	-.1262186	.0327027
feintother	.1298077	.0564429	2.30	0.021	.0191816	.2404339
_cons	2.78913	.0214403	130.09	0.000	2.747108	2.831152

```
. regress person_term_count female start_age_b festartage start_eth_white fewhite sta
> rt_state_origin_ut feutah nugradgpa fegpa parttime feparttime i.nsinst i.feinst i.s
> _year i.feyear uptotwoyear feupto2 graddeg fegrad nondegree fenondeg intentother fe
> intother if gradflag == 0, baselevels
note: 5.feinst omitted because of collinearity
note: 2017.feyear omitted because of collinearity
```

Source	SS	df	MS
Model	14559155	61	238674.671
Residual	69737848.8	4,601,066	15.1568895
Total	84297003.8	4,601,127	18.320947

Number of obs	= 4,601,128
F(61, 4601066)	= 15746.94
Prob > F	= 0.0000
R-squared	= 0.1727
Adj R-squared	= 0.1727
Root MSE	= 3.8932

person_term_count	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
female	-.4617552	.0233131	-19.81	0.000	-.5074481	-.4160624
start_age_b	-.0235612	.0003874	-60.82	0.000	-.0243205	-.0228019
festartage	.0069487	.0005043	13.78	0.000	.0059602	.0079371
start_eth_white	.4292126	.005955	72.08	0.000	.417541	.4408843
fewhite	-.0633877	.0084561	-7.50	0.000	-.0799613	-.0468141
start_state_orig~t	1.266252	.0063348	199.89	0.000	1.253836	1.278668
feutah	-.0470315	.0090719	-5.18	0.000	-.0648121	-.0292509
nugradgpa	.1122409	.0019663	57.08	0.000	.1083871	.1160947
fegpa	-.0147019	.0028591	-5.14	0.000	-.0203056	-.0090981
parttime	1.128909	.005506	205.03	0.000	1.118118	1.139701
feparttime	-.1285155	.0080102	-16.04	0.000	-.1442152	-.1128158
nsinst						
1. ASSO	0	(base)				
2. BACH	-.4897895	.0090048	-54.39	0.000	-.5074386	-.4721404
3. MASTERS	-.3503811	.0084114	-41.66	0.000	-.3668673	-.333895
4. NULL	-.9985484	.02311	-43.21	0.000	-1.043843	-.9532535
5. PHD	-.302657	.0095307	-31.76	0.000	-.3213368	-.2839771
feinst						
0	0	(base)				
1	-.0389999	.0133738	-2.92	0.004	-.0652121	-.0127877
2	-.1010514	.0139272	-7.26	0.000	-.1283482	-.0737546
3	.1479909	.0097516	15.18	0.000	.1288781	.1671036
4	.0755764	.0327233	2.31	0.021	.01144	.1397129
5	0	(omitted)				
s_year						
2000	0	(base)				
2001	.7930711	.0180479	43.94	0.000	.7576979	.8284444
2002	1.258303	.0171817	73.23	0.000	1.224627	1.291978
2003	1.797685	.0169045	106.34	0.000	1.764553	1.830818
2004	2.37675	.0171195	138.83	0.000	2.343196	2.410303
2005	2.679094	.0171095	156.59	0.000	2.64556	2.712629
2006	2.659909	.0173613	153.21	0.000	2.625882	2.693937
2007	2.766646	.0174339	158.69	0.000	2.732476	2.800815
2008	2.869108	.0175777	163.22	0.000	2.834656	2.90356
2009	3.016549	.0172674	174.70	0.000	2.982705	3.050392
2010	3.078878	.0168572	182.64	0.000	3.045838	3.111917
2011	3.180735	.0167015	190.45	0.000	3.148001	3.213469
2012	3.304431	.0166817	198.09	0.000	3.271735	3.337126
2013	3.457856	.0167687	206.21	0.000	3.42499	3.490722
2014	3.548263	.0168769	210.24	0.000	3.515185	3.581341
2015	3.518807	.0169648	207.42	0.000	3.485557	3.552058
2016	3.307845	.0169506	195.15	0.000	3.274622	3.341067
2017	3.134601	.0169544	184.88	0.000	3.101371	3.16783
feyear						
0	0	(base)				
2000	.1675058	.0240456	6.97	0.000	.1203773	.2146342
2001	.2154792	.0233513	9.23	0.000	.1697114	.261247
2002	.2450033	.0219485	11.16	0.000	.2019851	.2880215
2003	.1566895	.0214232	7.31	0.000	.1147009	.1986782
2004	.0741366	.0217925	3.40	0.001	.0314242	.1168491
2005	.0308347	.0217119	1.42	0.156	-.0117198	.0733892
2006	.0117891	.0220573	0.53	0.593	-.0314425	.0550207
2007	.0469031	.0221065	2.12	0.034	.0035751	.0902311
2008	.0712064	.0221002	3.22	0.001	.0278908	.1145219
2009	.0732573	.0215263	3.40	0.001	.0310665	.1154482
2010	.0683867	.0207852	3.29	0.001	.0276484	.109125
2011	.0210337	.0204652	1.03	0.304	-.0190774	.0611448
2012	-.0081929	.0203764	-0.40	0.688	-.0481298	.031744
2013	-.0179551	.0205003	-0.88	0.381	-.0581349	.0222246
2014	-.1182757	.0206688	-5.72	0.000	-.1587858	-.0777656
2015	-.1472847	.020763	-7.09	0.000	-.1879794	-.10659
2016	-.0269244	.0207034	-1.30	0.193	-.0675024	.0136537
2017	0	(omitted)				
uptotwoyear	-2.520901	.0078631	-320.60	0.000	-2.536312	-2.505489
feupto2	.4849704	.011111	43.65	0.000	.4631933	.5067476
graddeg	4.521466	.0303696	148.88	0.000	4.461942	4.580989
fegrad	-.3047762	.0438578	-6.95	0.000	-.390736	-.2188165
nondegree	-3.705584	.009045	-409.68	0.000	-3.723312	-3.687856
fenondeg	.5212225	.0125663	41.48	0.000	.496593	.545852
intentother	-.046758	.0405419	-1.15	0.249	-.1262186	.0327027
feintother	.1298077	.0564429	2.30	0.021	.0191816	.2404339
_cons	2.78913	.0214403	130.09	0.000	2.747108	2.831152

```
. logistic gradflag female start_age_b festartage start_eth_white fewhite start_state
> _origin_ut feutah nugradgpa fegpa parttime feparttime i.nsinst i.feinst i.s_year i.
> feyear uptotwoyear feupto2 graddeg fegrad nondegree fenondeg intentother feintother
> , baselevels
note: 5.feinst omitted because of collinearity
note: 2017.feyear omitted because of collinearity

Logistic regression                               Number of obs     =  5,401,255
                                                  LR chi2(61)       =  322924.50
                                                  Prob > chi2       =     0.0000
Log likelihood = -2104171.3                       Pseudo R2         =     0.0713
```

gradflag	Odds Ratio	Std. Err.	z	P>|z|	[95% Conf.	Interval]
female	1.153219	.0206673	7.95	0.000	1.113415	1.194446
start_age_b	.9968447	.0002893	-10.89	0.000	.9962779	.9974118
festartage	.9945695	.0003699	-14.64	0.000	.9938447	.9952948
start_eth_white	1.194041	.0052729	40.16	0.000	1.183751	1.204421
fewhite	1.005027	.0061412	0.82	0.412	.9930625	1.017136
start_state_orig~t	1.182355	.0053488	37.03	0.000	1.171918	1.192885
feutah	.9276707	.005819	-11.97	0.000	.9163355	.9391462
nugradgpa	1.56027	.0027112	256.01	0.000	1.554965	1.565593
fegpa	1.010634	.0025276	4.23	0.000	1.005692	1.0156
parttime	1.051389	.0040017	13.17	0.000	1.043575	1.059262
feparttime	.8869639	.0047605	-22.35	0.000	.8776824	.8963436
nsinst						
1. ASSO	1	(base)				
2. BACH	1.433879	.0101128	51.10	0.000	1.414195	1.453837
3. MASTERS	1.130723	.0079311	17.52	0.000	1.115285	1.146375
4. NULL	1.701048	.0274136	32.96	0.000	1.648158	1.755635
5. PHD	1.168662	.0089677	20.31	0.000	1.151217	1.186371
feinst						
0	1	(base)				
1	.8911486	.0093247	-11.01	0.000	.8730586	.9096133
2	1.126325	.0105199	12.74	0.000	1.105894	1.147133
3	1.049063	.0066851	7.52	0.000	1.036042	1.062247
4	1.152385	.0245328	6.66	0.000	1.105291	1.201486
5	1	(omitted)				
s_year						
2000	1	(base)				
2001	1.108951	.0159989	7.17	0.000	1.078033	1.140756
2002	1.071308	.0145196	5.08	0.000	1.043225	1.100147
2003	1.083935	.0143246	6.10	0.000	1.05622	1.112378
2004	1.149647	.015181	10.56	0.000	1.120274	1.179789
2005	1.171439	.0154248	12.02	0.000	1.141593	1.202064
2006	1.155605	.015452	10.82	0.000	1.125713	1.186291
2007	1.054187	.0142424	3.91	0.000	1.026639	1.082474
2008	1.113305	.0151443	7.89	0.000	1.084015	1.143386
2009	1.133099	.0151252	9.36	0.000	1.103838	1.163135
2010	1.095948	.0143308	7.01	0.000	1.068217	1.124399
2011	1.086728	.0141021	6.41	0.000	1.059437	1.114722
2012	1.125837	.0145006	9.20	0.000	1.097773	1.15462
2013	1.105516	.0143053	7.75	0.000	1.07783	1.133912
2014	1.199791	.0154719	14.12	0.000	1.169846	1.230501
2015	1.185151	.0153208	13.14	0.000	1.1555	1.215562
2016	1.249349	.0160323	17.35	0.000	1.218318	1.28117
2017	1.356327	.0172086	24.02	0.000	1.323014	1.390478
feyear						
0	1	(base)				
2000	1.091498	.0189305	5.05	0.000	1.055018	1.129239
2001	1.113134	.0181397	6.58	0.000	1.078143	1.149261
2002	1.022872	.0153168	1.51	0.131	.9932878	1.053337
2003	.9756919	.0140608	-1.71	0.088	.9485188	1.003643
2004	.9813432	.014122	-1.31	0.191	.9540512	1.009416
2005	.9418143	.013508	-4.18	0.000	.9157078	.968665
2006	.9409095	.0138822	-4.13	0.000	.9140906	.9685152
2007	.999849	.0148285	-0.01	0.992	.971204	1.029339
2008	1.031415	.015214	2.10	0.036	1.002023	1.061669
2009	.9857176	.0141173	-1.00	0.315	.958433	1.013779
2010	1.016326	.0139447	1.18	0.238	.9893591	1.044028
2011	1.01363	.0136792	1.00	0.316	.9871709	1.040799
2012	1.015411	.0135123	1.15	0.250	.9892702	1.042243
2013	1.05287	.0140584	3.86	0.000	1.025673	1.080787
2014	1.037786	.0137831	2.79	0.005	1.01112	1.065155
2015	1.035258	.0137696	2.61	0.009	1.008619	1.062601
2016	1.00117	.0131518	0.09	0.929	.9757218	1.027282
2017	1	(omitted)				
uptotwoyear	.5531037	.0032266	-101.52	0.000	.5468158	.559464
feupto2	1.297394	.0101644	33.23	0.000	1.277624	1.317469
graddeg	1.571478	.0225873	31.45	0.000	1.527825	1.616378
fegrad	.7439306	.0160746	-13.69	0.000	.7130828	.7761128
nondegree	.1667131	.0016348	-182.69	0.000	.1635394	.1699483
fenondeg	.8507257	.0116926	-11.76	0.000	.8281146	.8739542
intentother	1.824435	.0380866	28.80	0.000	1.751294	1.900632
feintother	.7776143	.0228991	-8.54	0.000	.7340034	.8238162
_cons	.0159873	.0002853	-231.73	0.000	.0154377	.0165565

Note: _cons estimates baseline odds.

```
. logistic gradflag female start_age_b start_eth_white start_state_origin_ut nugradgp
> a parttime i.nsinst i.s_year uptotwoyear graddeg nondegree intentother, baselevels

Logistic regression                               Number of obs     =  5,401,255
                                                  LR chi2(31)       =  318506.33
                                                  Prob > chi2       =     0.0000
Log likelihood = -2106380.4                       Pseudo R2         =     0.0703
```

gradflag	Odds Ratio	Std. Err.	z	P>|z|	[95% Conf.	Interval]
female	1.078672	.002707	30.18	0.000	1.073379	1.08399
start_age_b	.9930641	.0001798	-38.43	0.000	.9927117	.9934166
start_eth_white	1.197933	.0036542	59.20	0.000	1.190792	1.205116
start_state_orig~t	1.135962	.0035557	40.73	0.000	1.129015	1.142953
nugradgpa	1.566729	.0019553	359.76	0.000	1.562901	1.570566
parttime	.9897043	.0026548	-3.86	0.000	.9845147	.9949212
nsinst						
1. ASSO	1	(base)				
2. BACH	1.622122	.007832	100.19	0.000	1.606844	1.637546
3. MASTERS	1.240164	.0058046	45.99	0.000	1.22884	1.251594
4. NULL	1.995436	.0199618	69.06	0.000	1.956693	2.034947
5. PHD	1.246142	.0064835	42.29	0.000	1.233499	1.258915
s_year						
2000	1	(base)				
2001	1.119879	.0109289	11.60	0.000	1.098663	1.141506
2002	1.03305	.0095869	3.50	0.000	1.01443	1.052012
2003	1.019286	.0092566	2.10	0.035	1.001304	1.037591
2004	1.083621	.0098383	8.85	0.000	1.064509	1.103077
2005	1.081656	.0098121	8.65	0.000	1.062595	1.101059
2006	1.066888	.0098548	7.01	0.000	1.047746	1.086378
2007	1.004094	.0093197	0.44	0.660	.9859927	1.022527
2008	1.078132	.0100531	8.07	0.000	1.058607	1.098017
2009	1.07238	.009833	7.62	0.000	1.05328	1.091827
2010	1.05308	.0094144	5.79	0.000	1.034789	1.071694
2011	1.044473	.0092541	4.91	0.000	1.026492	1.06277
2012	1.083046	.0095159	9.08	0.000	1.064555	1.101858
2013	1.083682	.009547	9.12	0.000	1.065131	1.102556
2014	1.166727	.0102568	17.54	0.000	1.146796	1.187004
2015	1.15105	.01014	15.97	0.000	1.131347	1.171097
2016	1.192427	.0104419	20.10	0.000	1.172136	1.21307
2017	1.29278	.0111671	29.73	0.000	1.271077	1.314854
uptotwoyear	.6366344	.0024708	-116.35	0.000	.6318101	.6414954
graddeg	1.371301	.0146998	29.46	0.000	1.342791	1.400417
nondegree	.1525496	.0010465	-274.08	0.000	.1505121	.1546146
intentother	1.600312	.0235734	31.92	0.000	1.554769	1.647188
_cons	.0167444	.0002015	-339.88	0.000	.0163542	.017144

Note: **_cons** estimates baseline odds.

Endnotes

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[2] Utah Foundation. 2017. "Help Wanted: Workforce Participation, Wages, Job Desirability, and Skills Gaps." Research report number 746. http://www.utahfoundation.org/uploads/rr746.pdf

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[6] https://nces.ed.gov/ipeds/Home/AboutIPEDS

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[11] The 2000 experimental sample used a different sample design and is not as comparable to the 2001-2004 experimental samples and so is not used in these analyses.

[12] See Appendix A. We also use the subpop commands in Stata to allow standard errors to be calculated on all of the cases, not just the cases we are interested in. See UCLA's Institute for Digital Research and Education's "Statistical Computing Seminars: Applied Survey Data Analysis in Stata 11" for more information. http://www.ats.ucla.edu/stat/stata/seminars/applied_svy_stata11/

[13] There is also a question asking about the field of bachelor's degree. However, this question is only available for years after 2009 and is only relevant for about 20% of the Utah sample, and cell sizes for even broad field categories are small.

[14] Throughout this document we determine "statistical significance" at the 95% confidence level, usually using logistic or other regression analyses that may not be reported but for which code is available in Appendix A. This confidence level cutoff point is somewhat arbitrary, as statistical significance is typically reported using 90-99% confidence levels in social science, but we feel it represents a good middle point. Readers should also keep in mind that statistical significance is not the same as substantive significance (i.e., differences may be statistically significant but not socially meaningful), and the 1% samples that we use to show year-to-year differences are not as reliable as 3% and 5% samples available in 3- and 5-year estimates. Finally, estimates from 2001-2004 should especially be viewed with caution as these samples were smaller and considered experimental versions of the ACS.

[15] The model for Table 1 includes indicator variables for year with 2005 as the reference category.

[16] We tested for an interaction between being female and being born out of Utah to see if the effect of being born out of Utah on being enrolled in postsecondary education was different for men and women. In the reported analysis this interaction was not statistically significant at the 95% level, but the addition of other variables in the model changed this. We do not rule out the possibility of an interaction effect here.

[17] We use the IPUMS coded variable "poverty" for this. This variable reflects individual or family income depending on whether the individual is part of a family unit in the surveyed household, and it reports each individual's percent of the US poverty level. Individuals with a value less than or equal to 100 on this measure are counted as being "in poverty."

[18] See Appendix B – this difference seems to be dependent on whether we are controlling for women's labor force participation.

[19] U.S. Department of Education. Institute of Education Sciences, National Center for Education Statistics. https://nces.ed.gov/ipeds/Home/AboutIPEDS

[20] U.S. Department of Education. Institute of Education Sciences, National Center for Education Statistics. https://nces.ed.gov/programs/digest/2016menu_tables.asp

[21] Naven, Matthew. 2017. IPEDS. GitHub repository. https://github.com/mnaven/ipeds

[22] In earlier years, IPEDS tables do not differentiate between nonprofit and for-profit private control.

[23] Institutions are only required to report age every other year, so there is fluctuation in the number of institutions represented in these figures (and, consequently, some noise around the trendlines from year to year). Tables detailing the number of institutions responding in each year are provided in the appendix.

[24] Asian or Pacific Islander (2000-2007)
Asian (2008-2015)
Black non-Hispanic (2000-2007), Black or African American (2008-2015)
Native Hawaiian or Other Pacific Islander (2008-2015)
White non-Hispanic (2000-2007), White (2008-2015)
Multiple races allowed beginning in 2008

[25] The race/ethnicity categories changed beginning with 2008, but not all institutions participated in reporting with the new categories. Utah numbers for 2008 and 2009 only include a small group of institutions, and US numbers do not begin to use the new categories until 2010. Additionally, percentages may not add up to 100% beginning with 2008 because students were able to report more than one race/ethnicity category after that time.

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[27] See for an example of how age/gender changes in LDS mission service can impact postsecondary educational activities: Christiansen, Barbara. 2015. "UVU Enrollment Increases as LDS Missionaries Return." Daily Herald. Aug 27. Retrieved Feb 25, 2018 from https://www.heraldextra.com/news/local/education/college/uvu/uvu-enrollment-increases-as-lds-missionaries-return/article_6e99b71f-c7ec-58ee-b8d3-998214bf4d1c.html.

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[42] All counts include approximately 2.8% of students (N=185,184) who attended more than one institution in a given term (unless otherwise indicated).

[43] Each reported coefficient is statistically significant at the 0.05 level. These results are from a population of students, not a sample, so it is not necessary to estimate/report statistical significance (since statistical significance is an indication of whether the results found in a sample are likely to be found in the population). However, some researchers find statistical significance reassuring because it evokes confidence in statistical associations.