

The Effects of Four Decades of Recession on Higher Education Enrollments in the United States

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Abstract The United States experienced six economic recessions between 1970 and 2009. The impact of economic recession on higher education enrollment was examined using seasonally adjusted data from the U.S. Census and the U.S. Department of Labor Bureau of Labor Statistics, Unemployment Level-Civilian Labor Force. One-way analysis of variance, factorial Anova, and t-tests revealed that overall enrollments during recession years were not statistically different. Rather, higher education enrollments registered a steady rise over the four decades. However, enrollments differed by gender and ethnicity. In fact, powerful linkages were found to exist between gender and enrollment, and ethnicity and enrollment to recessions and unemployment and undergraduate enrollment. In sum, the study results indicated that recessions between 1970 and 2009 had very little restraining power on U.S. higher education enrollments.

Keywords Higher Education, Recession, Enrollments

1. Introduction

Between 1970 and 2009, the United States had experienced several recessions, generally due to economic policies and shifts within government expenditures (Hetzl, 2009; Kotz, 2009; Mirer, 1973; Mork & Hall, 1980). The National Bureau of Economic Research (2008) defined recession as “significant decline in economic activity spread across the economy, lasting more than a few months, normally visible in real GDP, real income, employment, industrial production, and wholesale-retail sales” (p. 1). As personal income ebbs during a recession, many individuals also experience diminishing labor market opportunities and, as a result, seek alternative routes to increase their earning potential. One such choice is enrolling in higher education. For example, “between 1980 and 1992, the value of future earning differentials between high school and some college for men increased about 116 percent” (Baum, 2001, p. 47).

In addition to diminishing labor market opportunities,

enrollment rates in public higher education are also heavily dependent on a variety of additional factors including tuition rates, the availability of state aid, as well as unemployment rates and opportunity costs (Betts & McFarland, 1995; Campbell & Siegel, 1967; Corazzini, Dugan, & Grabowski, 1972; Hossler, Lund, Ramin, Westfall, & Irish, 1997; Koshal & Koshal, 2000; Leslie & Brinkman, 1987). Between 1981 and 1993, tuition costs at public higher education institutions rose roughly 10% (Hossler et al., 1997). Unemployment has also been found to be a key factor in terms of one’s ability to pay for higher education (Betts & McFarland, 1995). A lull in labor force demands also tend to reduce the perceived employment opportunity costs, particularly for students right out of high school; which may lead to increased higher education enrollment. It has also been found that students forced into postsecondary education by recessions tend to attain the degree and continue with the program, even if the economy improves (Betts & McFarland, 1995).

Interestingly, cyclic economic events have led to shifting social perceptions over the past 40 years in terms of who should pay for higher education. Even more interesting, however, is that these shifting social perceptions have not had a dramatic effect on higher education enrollment rates. In some respects, specific legislation, as well as, other enacted strategies can be pointed to as means of avoiding steep enrollment declines. For instance, enrollment precipitously dropped in the 1970s because of a reduced college-bound populace. In an effort to encourage enrollment access, the Middle Income Assistance Act was enacted in 1978. Enrollment began to climb for students over the traditional age of 18-24; and in the 1980s, college rankings were used as a way to further attract quality students (Cohen, 1998).

Today’s economic woes, however, appear to continue to influence, societal views of higher education, again raising the questions among the public, “Who pays for higher education?” and “Who should pay?” At the same time, students pose a different question: “How am I going to pay for my college education?”

Public higher education institutions have traditionally relied on federal, state, and in some instances, local

governments for revenue. However, competition for increasingly limited government appropriations has increased for Medicaid, K–12 public schools, and prisons as each competes for government appropriations. Betts and McFarland (1995) note that this struggle for government funds has led to diluted quality of education, rationing of classes, tuition increases, strained research and graduate education, and stagnant faculty salaries.

2. Purpose

The motivation for this article was to better understand the impact and role of economic recession on higher education enrollment. Previous studies succinctly broached the relationship between recession and enrollment. Thus, this current study statistically examined the impact of economic recessions between 1970 and 2009 on higher education enrollments in U.S. colleges and universities. Of interest was whether recessions effectively influenced enrollment of various demographic groups. Also, unemployment levels were added to the statistical analysis in an effort to understand the impacts, as a direct result of economic recessions. For purposes of this study, the research questions were:

- How do recession years compared to non-recession years impact higher education undergraduate and graduate enrollments?
- How do recessions impact undergraduate and graduate enrollments by age ranges, gender, and ethnic groups?
- What is the relationship between recessions, unemployment rate, and higher education undergraduate and graduate enrollments?

3. Study Significance

A large body of literature has examined and found relationships among selected independent variables and higher education enrollment (e.g., employment rates, level of parental education, etc.; Campbell & Siegel, 1967; Corazzini et al., 1972; Hearn & Longanecker, 1985; Koshal & Koshal, 2000; Leslie & Brinkman, 1987; and Paulsen, 2001). However, few empirical research studies to date have examined the impact of economic recession on enrollment. Accordingly, Betts and McFarland (1995) found that unemployment rates were considered an influencing factor of college enrollment. Betts and McFarland's study, however, was limited to community college enrollment. Simple regressions were used to determine the relationship between unemployment rates and community college, full-time enrollment. This research found a 1% rise in the adult unemployment rate associated with a rise in full-time enrollment of 8.8%.

To date, student demand and enrollment studies have not fully examined the role of recessions to explain U.S.

higher-education enrollment rates. This void can lead to flawed policy and decision making related to issues of demand, access, and affordability.

4. Literature Review

4.1. U.S. Economic Recessions

Six recessions have affected the U.S. economy since the post-World War II period began, and these economic contractions have lasted an average of 11 months (Labonte & Makinen, 2002). Recessions for the past four decades share impact commonalities, which include shifts in government expenditures, inflation, unemployment, and rising oil prices (Hetzl, 2009; Kotz, 2009; Mirer, 1973; Mork & Hall, 1980). An increase in oil prices has preceded nine of the 10 post-World War II recessions (Labonte & Makinen, 2002). The current study examined the following years of recession: 1970, 1974–1975, 1980–1982, 1990–1991, 2001, and 2008–2009. The longest lasting recessions were 1973–1975 and 1981–1982, with both lasting 16 months (Labonte & Makinen, 2002).

The recessions of the 1970s are characterized by rising inflation and unemployment rates. Causes of the 1970 recession were high unemployment and increasing inflation in the late 1960s in combination with shifts in monetary and fiscal policies (Miran, 1973), whereas the 1974–1975 recessions were due primarily to a sharp spike in oil prices (Labonte & Makinen, 2002). Oil prices had risen from \$2.60/barrel in 1973 to \$11/barrel in 1975 (Labonte & Makinen, 2002). Unemployment during the 1970 recession climbed to 6.1%, whereas the 1974–1975 recession had a maximum unemployment rate of 9.0% (Labonte & Makinen, 2002; Mirer, 1973).

In the early 1980s, a double-dip recession occurred, caused mainly by the federal government's desire to reduce the inflation rate to a more acceptable level and rising oil prices (Labonte & Makinen, 2002). Oil prices rose as a result of the Iranian revolution. Maximum unemployment rate for the 1980–1982 recessions peaked at 10.8% (Labonte & Makinen, 2002). Once again federal policy and rising oil prices were explanations for the 1990–1991 recession. The invasion of Kuwait by Iraq contributed to the spike in oil prices. Unemployment rate for the 1990–1991 recession was 7.8% (Labonte & Makinen, 2002).

Declining GDP and the September 11 terrorist attack contributed to the economic contraction of 2001. Unemployment had risen to 5.8% by the end of 2001 (Kotz, 2009). The origin of the 2008–2009 recession stemmed from monetary policy and private financial institutions' practices surrounding the real estate market (Verick & Islam, 2010). The unemployment rate for the 2008–2009 recession began at 5% and at the end of this recession was 9.5%.

4.2 Student Demographics

Higher education enrollment has experienced continual expansion in both density and diversity of the student body. More students graduating from high school, from 83% in 1975 to 87% in 1996, has been the catalyst for the rise in university and college enrollment (Cohen, 1998). Older students, women, minority, and part-time students have also altered the traditional pattern of enrollment. "Between 1975 and 1995, enrollment of twenty-five to twenty-nine year old students ranged from 10 to 12 percent" (Cohen, 1998, p. 321). In the 1960s and early 1970s, a higher percentage of men entered higher education, but by the mid-1970s, more women and African-American students were enrolling in higher education. Increases in non-traditional aged student enrollment coincided with an increase in part-time student enrollment, since many of these students worked and/or had other non-academic responsibilities. "Part-timers increased from 39 percent in 1975 to 43 percent in 1994" (Cohen, 1998, p. 324).

4.3. Human Capital Theory

According to microeconomic human capital theory, an increase in education will produce gains in employability (Paulsen, 2001). However, a student's choice to enroll and attend higher education can be limited by available financial resources, in addition to personal aspirations and goals. In other words, students gauge whether or not a higher education is worthwhile by juxtaposing the expected or marginal benefits with the expected or marginal costs ($mb > mc$) connected with their investment in a higher education. The rate of return of investment in a college education will be higher if the opportunity costs are lower for the student while attending college. Paulsen (2001) went on to note that this situation "occurs when the general economy is in a recession" (p. 61). This study aimed to determine how recessions over the last four decades have impacted U.S. higher education enrollments.

5. Methodology

5.1. Sample Data

Primary source seasonally adjusted sample data in the form of the U.S. Census from 1970 through 2009 were examined. The U.S. Census Bureau defines "seasonally adjusted" as "the process of estimating and removing seasonal effects from a time series in order to better reveal certain non-seasonal features" (United States Census Bureau, 2011a). The U.S. Census data are nationally aggregated data and were retrieved from the 2010 Current Population Survey as seen in the Census Bureau's website, (Tables A-5a: The Population 14 to 24 Years Old by High School Graduate Status, College Enrollment, Attainment, Sex, Race, and Hispanic Origin: October 1967 to 2009, <http://www.census.gov/hhes/school/data/cps/historical/index.html> and A-7: College Enrollment of Students 14 Years

Old and Over, by Type of College, Attendance Status, Age, and Sex: October 1970 to 2009, <http://www.census.gov/hhes/school/data/cps/historical/index.html>) as well as data from the Bureau of Labor Statistics, Unemployment Level-Civilian Labor Force (<http://data.bls.gov/pdq/SurveyOutputServlet>).

Raw data, as reflected by the U.S. Census between 1970 and 2009, were plotted using a Microsoft Excel 2007 spreadsheet to visually conceptualize higher education enrollment trends during recession versus Non-recession years for the following test variables: higher education level (undergraduate and graduate), age range (20–21 years, 22–24 years, and 25–34 years), gender (male and female), ethnicity (Caucasian and African-American), and unemployment levels. The raw data were logarithm 10 transformed (\log_{10}), in order to meet the assumptions of parametric statistical tests of normality of distribution and homogeneity of variances (Sokal & Rohlf, 1995).

5.2. Data Analysis

Descriptive and inferential statistics were used to analyze the data for purposes of this study. Analysis of enrollment data were conducted using independent *t*-tests, analysis of variance (ANOVA) models and regression analysis. Independent *t*-tests allowed for the comparison of the difference between the observed means and the difference between the expected means to determine if there was statistical difference in both undergraduate and graduate enrollment between 1970 to 2009 recessions and non-recession years.

One-way and factorial ANOVA models were used to determine differences between the means of undergraduate and graduate enrollments by age range, enrollment by gender, enrollment by ethnicity, and enrollment by interaction between gender and ethnicity, during recession and non-recession years. All assumptions of ANOVA were met, except homoscedasticity. Peckham and Sanders (1972) suggest that if all sample sizes within an analysis are equal, heteroscedasticity is not an issue. The sample sizes within each analysis were equal in this study. Recession year coefficients were strongly leveraged but were not removed from any analyses because the study's main aim was to examine the effects of recessions on enrollment.

SPSS version 16 (IBM, New York, USA) was used for all analyses and considered *p*-values < 0.05 as evidence of statistically significant departure from the null.

5.2.1. Temporal analysis

To look for evidence of change in enrollment between recessions and non-recession years, two *t*-tests were used to investigate the effect of recessions (years of recession: 1970, 1974, 1975, 1980, 1981, 1982, 1990, 1991, 2001, 2008, and 2009) on variation in enrollment for undergraduate and graduate students. The sample size for all temporal analyses were $n = 40$, since the study utilized 40 years of enrollment data. Each year's enrollment was considered an independent

subject.

5.2.2. Age range analysis

For determining differences among enrollment within different age ranges, two-way factorial ANOVA models were used to investigate the effects of age ranges (20–21 years, 22–24 years, and 25–34 years), time (recession and non-recession years), and any interactions between time (recession and non-recession years) and age ranges on variation in undergraduate and graduate enrollment from 1970 through 2009. The sample size for all age analyses were $n = 120$. There was a significant change among the three age ranges for undergraduate and graduate enrollment, so paired, age-range comparisons were performed to determine, what two age ranges were statistically different from one another by enrollment.

5.2.3. Gender analysis

Two-way factorial ANOVA models were used to investigate the effects of gender (males and females 18 through 24 year of age), time (recession and non-recession years), and any interaction between time and gender on variation in both undergraduate and graduate enrollment in the United States from 1970 through 2009. The sample size for all gender analyses were $n = 80$.

5.2.4. Ethnicity analysis

Two-way factorial ANOVA model was used to investigate the effects of ethnicity (Caucasians and African-Americans 18 through 24 years of age), time (recession and non-recession years), and any interaction between time and ethnicity on variation in higher education enrollment in the United States from 1970 through 2009. The sample size for all gender analyses were $n = 80$.

5.2.5. Gender and ethnicity analysis

A three-way factorial ANOVA model was used to investigate the effects of gender (males and females), ethnicity (Caucasians and African-Americans), time (recession and non-recession years), and any interaction between gender, ethnicity, and time on variation in higher education enrollment for student 18 through 24 years of age in the United States from 1970 through 2009. The sample size for gender/ethnicity interaction analyses were $n = 160$.

5.2.6. Unemployment analysis

Two *t*-tests were used to determine relationship between recessions/non-recession years and unemployment levels, undergraduate enrollment and unemployment levels, and graduate enrollment and unemployment levels. The Bureau of Labor Statistics October unemployment levels from 1970 to 2009 were used, since U.S. Census enrollment data were collected in October of the respective years. Regression analysis was used to predict undergraduate and graduate enrollment from unemployment levels. The sample size for unemployment analyses were $n = 40$.

6. Results

6.1. Temporal Analyses

Results showed no significant differences in enrollment between recession and non-recession years for both undergraduate ($t_{(38)} = -0.665, p = 0.516$) and graduate ($t_{(38)} = -0.715, p = 0.479$) students 14 years and older in the United States (Table 1). Enrollment was not impacted differently by recessions.

Table 1....

Higher Education Institutional Level		t	df	p
Undergraduate Enrollment	Recession years vs. Non-recession years	-0.665	38	0.516
	Graduate enrollment	Recession years vs. Non-recession years	-0.715	38

Table 2.....

Higher Education Institutional Level		F	df	p
Undergraduate enrollment	Age groups	180.823	2	0.005
	Time	5.943	1	0.135
	Age groups * Time	0.176	2	0.839
Graduate enrollment	Age groups	4075.193	2	0.000
	Time	0.186	1	0.708

Note. Two-way factorial ANOVA models were used to investigate the role of age ranges, time, and any interactions between time and age ranges on variation in enrollment in the United States from 1970 through 2009.

6.2. Age Range Analysis

Enrollment was found to differ across age for both undergraduate ($F_{(2, 2)} = 180.823, p = 0.005$) and graduate ($F_{(2, 2)} = 4075.193, p < 0.001$) students 14 years and older (Table 2). There were significant differences between the three age groups suggesting that undergraduate (20-21 yrs. $M = 6.438, SD = 0.882$; 22-24 yrs. $M = 6.224, SD = .142$; and 25-34 yrs. $M = 6.254, SD = .118$) and graduate (20-21 yrs. $M = 4.688, SD = 0.183$; 22-24 yrs. $M = 5.753, SD = .065$; and 25-34 yrs. $M = 6.057, SD = .093$) enrollment differed due to more than chance alone; there was some other effect. However, based on the results, recessions were not the effect impacting various age groups enrolling in undergraduate ($F_{(2,114)} = 0.176, p = .839$) or graduate programs ($F_{(2,114)} = 0.257, p = .774$). Follow-up analyses were conducted to identify differences among the levels of the age factor. Undergraduate students between ages 20 to 21 were found to be statically different from the other two age ranges: undergraduate students ages 22 -24 ($F_{(2,117)} = 65.148, p = 0.001$), undergraduate students ages 25–34 ($F_{(2,117)} = 65.315, p = 0.001$) year range (Table 3). Whereas, graduate age ranges were significant between 20–21 year range and 22–24 year range ($F_{(2,117)} = 1195.133, p = 0.001$), between 20–21 year range and 35–34 year range ($F_{(2,117)} = 1766.623, p =$

0.001), and between 22–24 year range and 25–34 year range ($F_{(2,117)} = 285.093, p = 0.001$; Table 3).

6.3. Gender Analysis

The interaction between gender and time for undergraduate students was found to be significant ($F_{(1,1)} = 0.176, p = 0.002$; Table 4). There were differences between the genders signifying that undergraduate and graduate enrollment differed due to more than chance alone; there was some other effect, yet recessions were not influencing men or women to enroll in undergraduate programs. Female undergraduate enrollment in 1978 began to supersede that of their male counterparts and by 2009 the percent difference between male and female undergraduate enrollment was approximately 22% (Figure 1). Female graduate enrollment did not begin to surpass male graduate enrollment until 1988, and by 2009 there was a 37% difference between male and female graduate enrollment (Figure 2). Interestingly, however, there was no significant difference from gender, recession/non-recession time, or any interaction between gender and recession/non-recession time for graduate students (Table 4).

Table 3.....

Higher Education Institutional Level	Paired Comparisons	F	df	p
Undergraduate enrollment	20-21 years vs. 22-24 years	65.148	1	0.000
	20-21 years vs. 25-34 years	62.315	1	0.000
	22-24 years vs. 25-34 years	1.038	1	0.311
Graduate enrollment	20-21 years vs. 22-24 years	1195.133	1	0.000
	20-21 years vs. 25-34 years	1766.623	1	0.000
	22-24 years vs. 25-34 years	285.093	1	0.000

Note. ANOVA models were used to examine paired age range comparisons to determine between which two age ranges possessed the greatest statistically changes.

Table 4.

Higher Education Institutional Level		F	df	p
Undergraduate enrollment	Gender	11.825	1	0.922
	Time	4.292	1	0.811
	Gender * Time	0.176	1	0.002
Graduate enrollment	Gender	0.010	1	0.936
	Time	3.283	1	0.321
	Gender * Time	0.242	1	0.624

Note. Two-way factorial ANOVA models were used to investigate the effects of gender, time, and any interaction between time and gender on variation in enrollment in the United States from 1970 through 2009.

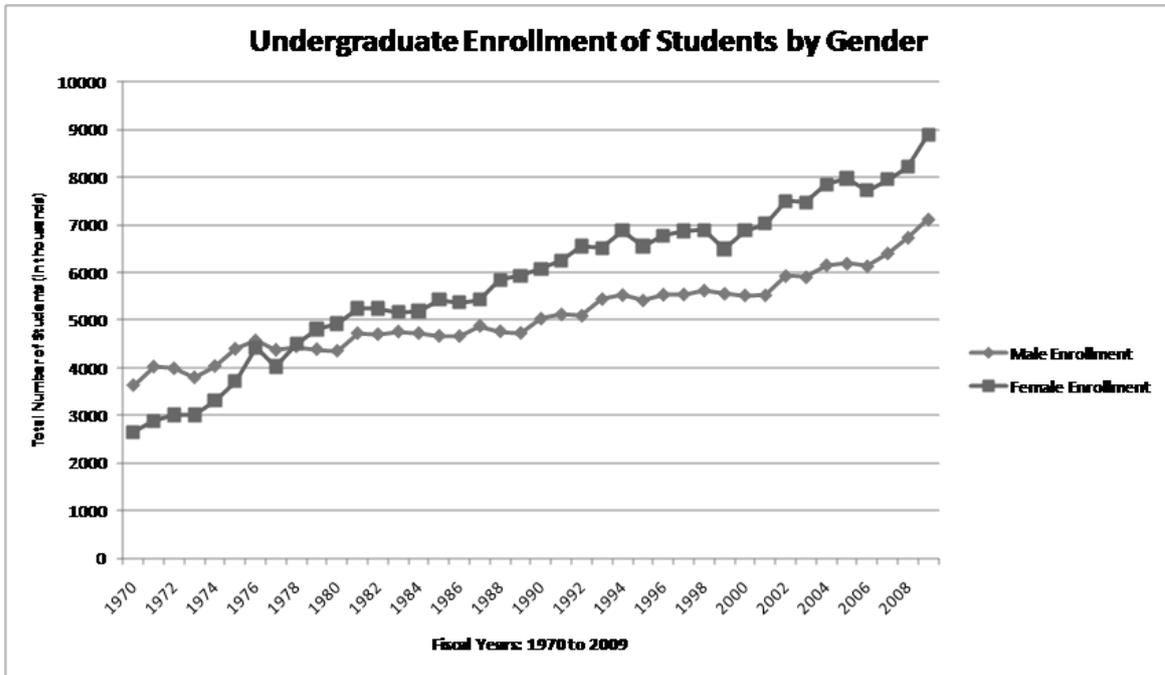


Figure 1. Undergraduate enrollment of students by gender

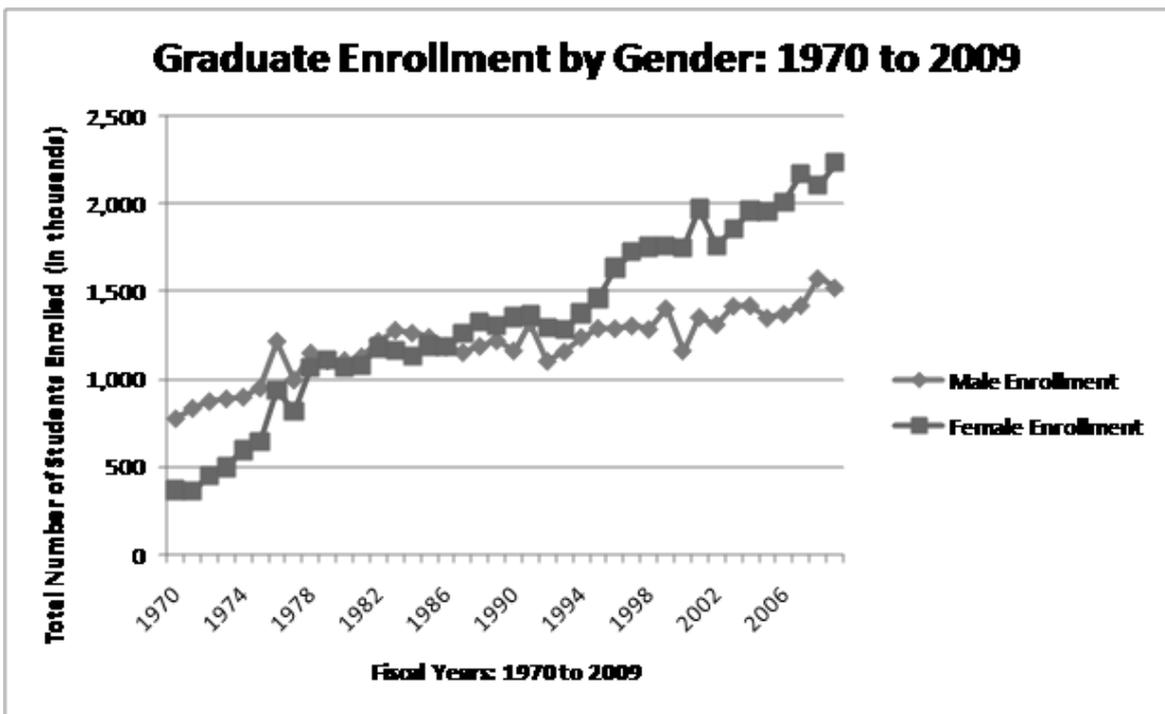


Figure 2. Graduate enrollment of students by gender

6.4. Ethnicity Analysis

Enrollment percentage for both Caucasian (43%) and African-Americans (74%) was higher during the 11 recession years examined in this study, as compared to the enrollment percentage for the 29 non-recession years (Caucasian, 32%; African-Americans, 63%), recessions did not appear to be a cause of increased enrollment. In 1970 (a

recession year), Caucasian higher education enrollment was 7.8% greater than that of African-American higher education enrollment (Figure 3). By 2009 (a recession year), the percent difference between African American enrollment and Caucasian enrollment was 17.19%; the gap between both ethnicities had increased roughly by 9%. The statistical findings confirmed there were differences between both ethnicities ($F_{(1,1)} = 3957.790, p = 0.010$; Table 5).

6.5. Gender and Ethnicity

Recessions had no influence on either African-American males/females or Caucasian male/females enrolling in higher education. However, the effects on gender and ethnicity on Higher Education enrollment was significant ($F_{(1, 1)} = 4158.248, p = 0.010$; Table 6). In 1975, African-American female higher education enrollment exceeded African-American male enrollment, whereas Caucasian female higher education enrollment did not exceed Caucasian male enrollment until 1988 (Figure 4). Enrollment percent change from 1970 to 2009 was 75% for African-American female, 71% for African-American male, 55% for Caucasian female, and 30% for Caucasian male, respectively.

The results of the *t*-tests showed there is a significant relationship between recession/non-recession years and unemployment levels ($t_{(38)} = 2.023, p = 0.05$), when the α -level was set at 0.01. Both undergraduate ($t_{(39)} = 223.280, p = 0.001$) and graduate ($t_{(39)} = 223.280, p = 0.001$) enrollment possessed a significant enrollment relationship to unemployment levels (Table 7, Figure 5). The results statistically showed recessions were not the affect. Pearson correlation showed a positive correlation between undergraduate enrollment and unemployment ($r = 0.585$), so as unemployment increases so will undergraduate enrollment. Whereas, graduate enrollment and unemployment represented a negative correlation ($r = -0.312$), as unemployment increases, graduate enrollment will decline.

6.6. Unemployment Analysis

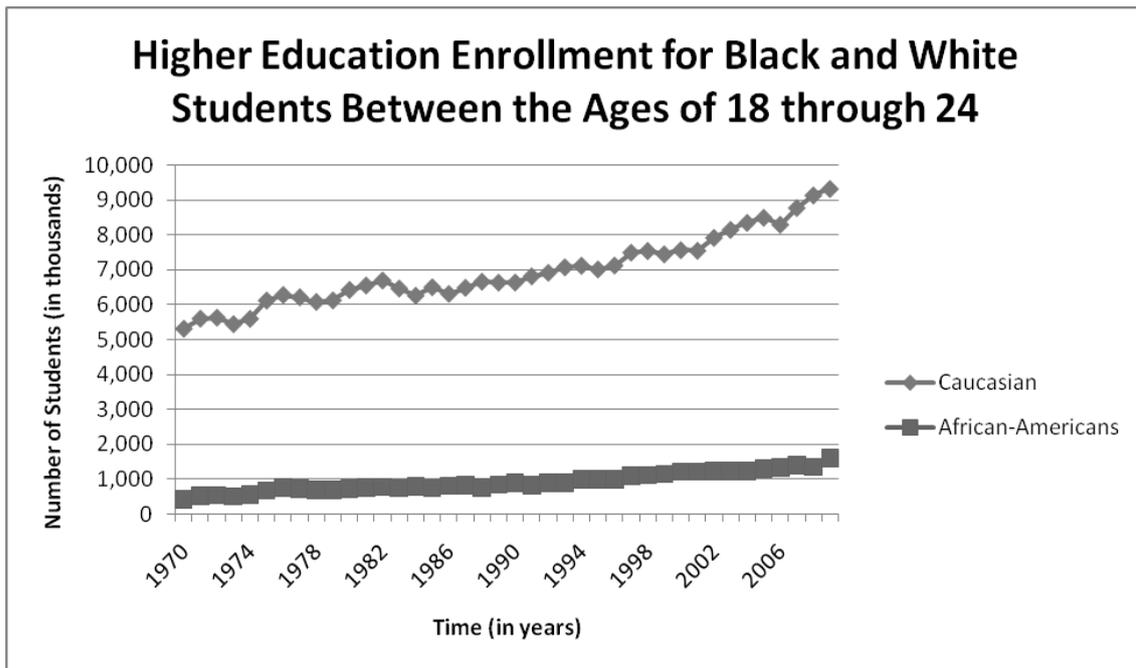


Figure 3. Higher education enrollment of students by ethnicity

Table 5. ...

		F	df	<i>p</i>
Higher Education enrollment	Ethnicity	3957.790	1	0.010
	Time	1.898	1	0.400
	Ethnicity * Time	0.285	1	0.595

Note. Two-way factorial ANOVA model was used to investigate the effects of ethnicity (Caucasian and African-American), time, and any interaction between time and ethnicity on variation in higher education enrollment in the United States from 1970 through 2009.

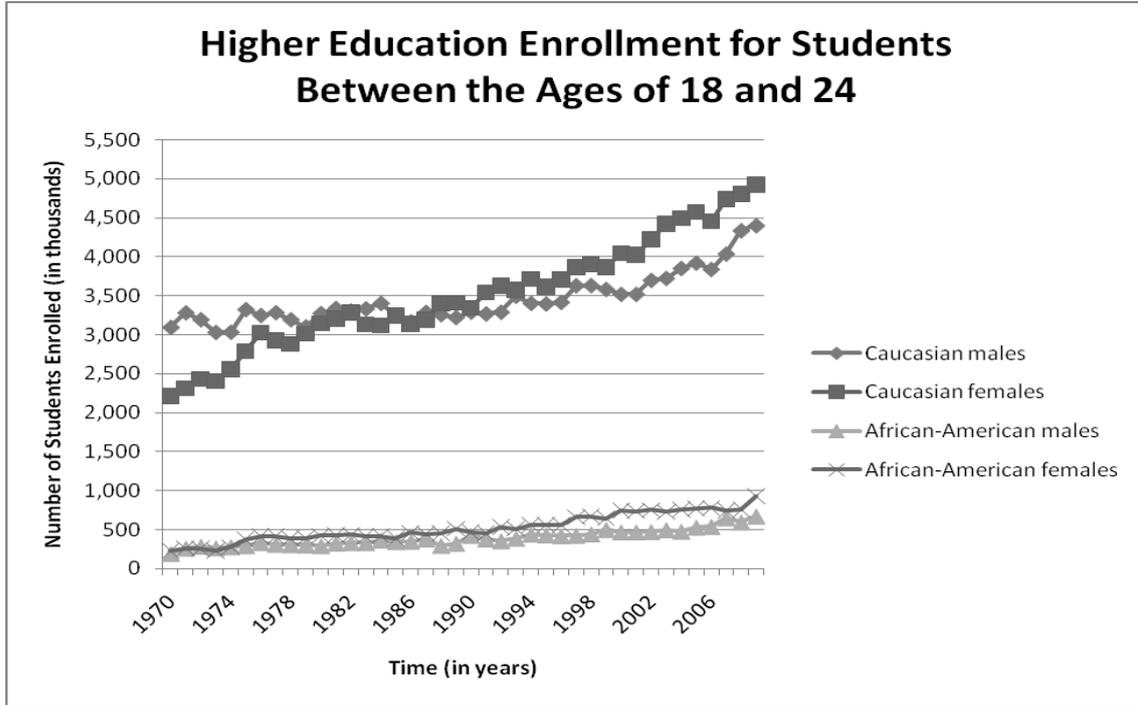


Figure 4. Higher Education enrollment of students by gender and ethnicity

Table 6.

		F	df	p
Higher Education enrollment	Gender	0.846	1	0.522
	Ethnicity	246.405	1	0.031
	Time	1.675	1	0.345
	Gender*Ethnicity	4158.248	1	0.010
	Gender*Time	87.792	1	0.068
	Ethnicity*Time	214.731	1	0.043
	Gender*Ethnicity*Time	0.002	1	0.965

Note. Three-way factorial ANOVA model was used to investigate the effects of gender, ethnicity (Caucasian and African-American), time (recession and non-recession), and any interaction between gender, ethnicity, and time on variation in higher education enrollment in the United States from 1970 through 2009.

Table 7.

Higher Education Institutional Level	t	df	p
Undergraduate enrollment	223.280	39	0.000
Graduate enrollment	223.280	39	0.000

Note. Independent t-tests results of the effect of unemployment on variation in undergraduate and graduate enrollment.

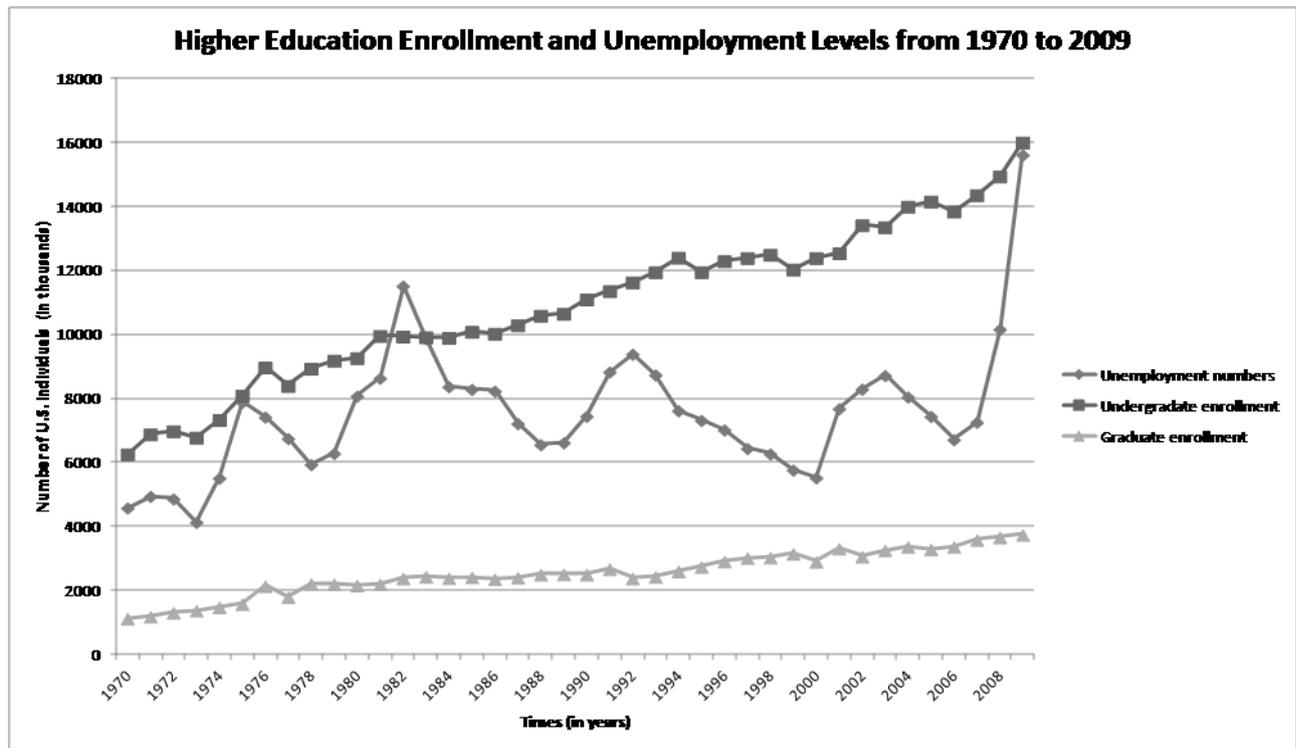


Figure 5. Higher education enrollment and unemployment levels

7. Discussion

It is well documented that unemployment levels are tied to the health of the U.S. economy and are a determinant of undergraduate enrollment. Further, unemployment levels primarily affect individuals without necessary skills and training, compelling these individuals to enroll in college (Betts & McFarland, 1995). Individuals with at least an undergraduate degree are less affected by economic swings. Opportunity costs, however, make the need to further their education in graduate school less appealing, hence, the indirect correlation between unemployment and graduate enrollment in the U.S.

From 1970 to 2009, the United States experienced 11 non-consecutive years of economic recession and 29 years of economic expansion (non-recession) years. The present findings suggest that U.S. higher education enrollment was not impacted by economic recessions. Further, Cohen's effect size value ($d = .216$) for undergraduate enrollment, and Cohen's effect size value ($d = 0.234$) for graduate enrollment suggested low practical significance for both analyses. Collectively, U.S. Higher Education undergraduate enrollment has risen by approximately 155% within the forty-year period. However, between 1919 and 1964, a study by Campbell and Sigel (1967) showed price, an economic variable of Higher Education, possessed a negative influence upon the demand for tertiary education. Graduate enrollment has increased over the forty-year period by approximately 229%. Increased funding and the coupling of the private industry and university-based research can account for the

large increase in graduate enrollment (Cohen, 1998, p. 416). Overall enrollment growth is justifiably due to a shift in social justice motives and seeking a mix of financial revenue sources, consisting of endowment income, grants, rented capital and advertising efforts to attract a larger and more diverse group of consumers (McPherson & Winston, 1991).

Further disaggregation of enrollment data by demographic groups (age, gender, and ethnicity) revealed age ranges and ethnicity significantly impact enrollment. This study classified age into the following age ranges: 20–21 years, 22–24 years, and 25–35 years; these were the identical ranges used by the U.S. Census Bureau, Table A-7: College Enrollment of Students 14 Years Old and Over, by Type of College, Attendance Status, Age, and Sex: October 1970 to 2009, in categorizing and reporting census data. For undergraduate enrollment, the three age ranges are considered non-traditional. Thus, the analysis is limited by the exclusion of traditional age ranges, those students younger than 20 years. The same three age ranges were used in the analysis for the graduate enrollment, but for this analysis the older portion of the graduate population was omitted. The three age ranges excluded traditional-age undergraduate students, those younger than twenty years old, and graduate students older than 35 years. Nevertheless, recessions were not the effect impacting various age groups enrolling in undergraduate or graduate programs. The rise in high school graduation rates can account for the rise in undergraduate enrollment; high school graduation increased by 2% from 1975 to 1996 (Cohen, 1998, p.324). Enrollment of undergraduates twenty to twenty-one-year-old showed an

approximate 119% increase and an approximate 228% increase was found for twenty-two to twenty-three-year olds. The twenty-five to thirty-five-year-old undergraduate cohort possessed the largest percent increase, approximately 264%, over the forty-year period. Equal opportunity policies written in the 1960s and 1970s, such as the Civil Rights Act of 1964, the President's Commission on Equal Employment Opportunity, Affirmative Action, and Age Discrimination Act of 1975 opened the doors to non-traditional students. Students could attend part-time at a higher education institution while continuing to work a full-time job; this allowed students to hold on to some earning opportunities. Graduate enrollment showed a percent increase for all three age groups over time. The greatest percent increase, approximately 159%, was found for the twenty-five to thirty-five-year-olds. Job upgrading, selective admission policies and reformation of disciplines influenced college graduates to enroll in graduate programs (Cohen, 1998, p. 324).

With regard to the study demographic variables, higher education enrollment was found to be significantly related to ethnicity. In 1970, there were 5,305,000 Caucasians and 416,000 African-Americans enrolled in Higher Education institutions. The enrollment percent difference between both ethnicities was 7.8% in 1970. By 2009, Caucasian enrollment totaled 9,327,000 students and African-American enrollment totaled 1,604,000 students. The percent difference between both ethnicities was 17.19%. Economic recessions were occurring in 1970 and 2009. The gap between Caucasian and African-American Higher Education enrollment has widened over the 40-year period. Access and cost opportunities, since the 1970s have allowed all ethnicities to take full advantage of either university or college education. However, according to Aronson (2004), one factor that may influence the ethnicity enrollment gap is stereotype threats. Another contributing factor is the parents' and students' knowledge of college costs and admission requirements; "minority groups are less informed about college costs than whites" (Grodsky & Jones, 2007).

Even though the gap between ethnicity enrollment has grown, both African-American and Caucasian female Higher Education enrollment is far greater than that of the males of either ethnicities.

According to Rosener (1990, p. 120), "The women's success shows that a nontraditional leadership style is well suited to the conditions of some work environments and can increase an organization's chances of surviving in an uncertain world."

With the use of U.S. Census data and data from the Bureau of Labor Statistics, Unemployment level-Civilian Labor Force in combination with inferential analysis, the study results indicated that the recessions between 1970 to 2009 had very little restraining power on higher education enrollments in the U.S. Rather, higher education enrollments have been on a steady rise over the four decades. Also, powerful linkages were found to exist between gender and enrollment, and ethnicity and enrollment to recessions and

unemployment and undergraduate enrollment.

Aggregated data were used as opposed to disaggregated data and, data used for the age range analysis did not include undergraduate students younger than 20 years of age, nor graduate students older than 35 years of age. Use of aggregated data, however, allowed for various classifications of demographic variables that provide an overall national picture of higher education enrollments. In addition, since unemployment levels have been found to be an influential factor on college enrollments; the researchers have also included unemployment levels between 1970 – 2009 in comparison to college enrollments. Another strength of the data analysis are F values reported.

7.1. Limitations

This study investigated the impact of economic recessions on undergraduate and graduate enrollment in U.S. higher education institutions. Independent variables included age, gender, ethnicity, and unemployment level. Data used for age range analyses were missing for the undergraduate students younger than 20 and graduate students older than 35 years. Further, the breadth of the age analyses were inhibited due to the use of U.S. Census data age ranges and did not produce a full statistical understanding of how recessions affect undergraduate and graduate enrollment by age.

The data was log10 transformed in this study and although transformations are useful tools, they alter the number of variables making the interpretation more complex. The data limited the study in scope and scale. Aggregated data were used as opposed to disaggregated regional or localized data sets (scope), or institution type data sets (scale). This was done because the U.S. Census survey data did not differentiate between university and college enrollments. Further, use of U.S. Census survey data provided an aggregated view of higher education enrollment. Enrollment trends can vary over regions and during decades, and these local trends may not be visible with aggregated data. Finally, aggregated data may have limited the potential of finding statistical trends between college and university enrollment during recession versus non-recession years.

7.2. Recommendations for Further Research

The current study revealed the need for further investigation of Higher Education enrollment during recession and related policy making. This study's results revealed that male higher-education enrollment is lower than female enrollment. Research is needed to better understand why males appear to be forgoing higher education. Expanded student recruitment targeting males seems to be necessary.

Secondly, it was revealed that African-American enrollment is still lower than their Caucasian counterparts and the gap between the two ethnicities is widening. Therefore, additional policymaking in this area may be prudent in order to determine what obstacles prevent these

students from enrolling and what opportunities and motivating elements can be applied to stimulate their respective enrollments. Opportunity costs related to higher education will also need ongoing attention to truly explain why students continue to relish higher education during both recession and non-recession years.

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