

Effect of Gender on College Students' Satisfaction and Achievement: The Case of a Midsized Midwestern Public University

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Abstract

One way through which quality and overall effectiveness of higher educational institutions are measured is by student outcomes, such as student retention, attrition, and graduation rates. One such factor that affects student retention, attrition, and graduation rate is college students' satisfaction with the college experience. Although a number of studies have been conducted to examine the effect of student satisfaction on GPA, there are only few studies that have examined the effect of gender on college students' satisfaction and GPA, whose findings were inconsistent. This study replicates and extends the research on the effect of gender on different college outcomes such as students' satisfaction, ACT scores, and GPA at a midsized Midwestern public university. Selected demographic and attitudinal data were collected between 2001 and 2009 from a sample of 5223 senior students representing five colleges at the university. We find that gender has a significant effect on student's satisfaction, ACT scores, and GPA. However, the effect size of gender on satisfaction and ACT scores was minimal. Implications of these findings and future research directions are discussed.

Key words: Satisfaction, retention, students, gender, achievement, GPA, higher institutions.

Introduction

Student satisfaction is an important part of the effort to successfully market higher education (Hermans, Haytko, & Mott-Stenerson, 2009: 1). If students are viewed as consumers of higher education, their satisfaction is crucial (Moro-Egido † & Panadés, 2008). One way through which quality and overall effectiveness of higher educational institutions are measured is by student outcomes, such as student retention, attrition, and graduation rates (Wintre & Bowers, 2007; Schreiner, 2009). As a result, institutions are now examining factors that affect student retention, attrition, and graduation rates. One such factor that affects student retention, attrition, and graduation rate is college students' level of satisfaction with the college experience (Moro-Egido † & Panadés, 2008; Russell & Lehman; Schreiner, 2009). Hence, student satisfaction is of compelling interest to colleges and universities as they seek to continually improve the learning environment for students, meet the expectations of their constituent groups and legislative bodies, and demonstrate their institutional effectiveness. Although a number of studies have been conducted to examine the effect of college student satisfaction on GPA, there are only few studies that have examined the effect of gender on college students' satisfaction and GPA, whose findings were inconsistent.

In the past, the notion of gender gaps in higher education has been viewed from the perspective of inequities faced by females as they progress through the educational pipeline. Even today, the topic of gender differences continues to receive significant attention at both the institutional and national levels (Sax & Harper, 2005; Reynolds & Burge, 2007). Gender differences in education continue in the United States despite decades of intense scrutiny and policy changes. Yet, women have made great strides in education and advances in the labor market. Today, women comprise the majority of college enrollments and have recently closed longstanding gender gaps in educational attainment (Brondou, 2010; Sax & Harper, 2005; Ballantine, 2001). Among high school graduates in October of 2007, 68 percent of young women compared with 66 percent of young men were likely to be enrolled in college (U.S. Department of Labor, 2008:3). Correspondingly, the proportion of women with a college degree more than tripled from 1970 to 2007 as women increasingly attained higher levels of education (U.S. Department of Labor, 2008:1). According to Hays, et. al., (2009), in 2004, 57.5 percent of bachelor's degrees and 58.9 percent of master's degrees were earned by women.

The increase in women pursuing higher levels of education corresponds with the growing percentage of women in the workforce; an estimated 46.8 percent of the current labor force is female. Further, women are expected to account for 51.2 percent of the increase in total labor force growth between 2008 and 2018 (U.S. Department of Labor, 2009). Thirty-five percent of women in the labor force held college degrees in 2007, compared with only 11 percent in 1970 (U.S. Department of Labor, 2008:1).

The projections for women in the labor force hastened due to the recent economic recession. A dramatic change in women's roles coupled with astronomical job losses for men due to the recession were cited as reasons for the employment transformation. U.S. Department of Labor (2009) reported that women were on the verge of outnumbering men in the workforce for the first time, a historic reversal. There are more women than men employed in the United States, and some traditionally male-dominated professions are now dominated by women (Brondou, 2010). The only parts of the economy still growing - health care, education and government - have traditionally hired mostly women. That dominance has increased in part because federal stimulus funding directed money to education, health care and state and local governments (Bureau of Labor Statistics, 2009). An estimated 66 million women were employed in the U.S. - 74 percent of employed women worked on full-time jobs, while 26 percent worked on a part-time basis (U.S. Department of Labor, 2009).

Although the number and performance of female college students has substantially increased, a gender gap still exists, causing some researchers to examine this gap during the college years. In 2007, women earned 80 percent of men's earnings, up from 62 percent in 1979 (U.S. Department of Labor, 2008:1). According to Chee, Pino, & Smith (2005), education is like a dual-edged sword. It has been a source of advancement, empowerment, and liberation for women, but it has also reinforced gender inequalities.

Persell, James, Kang, & Snyder (1999: 407) conclude that "there is little doubt that education serves as a key for understanding gender issues in part because it largely mirrors social relationships in society." When it comes to gender issues in education, most of the attention has been focused on the elementary and secondary levels (Jacobs, 1996; Sax & Harper, 2005). This does not mean that there has been no research in gender issues in higher educational institutions. Some research studies have shown a gender gap on a variety of outcomes such as satisfaction, GPA, choice of major, emotional distress, and cognitive differences which originated prior to college entry and are reinforced during the college years (Astin 1993; Strayhorn & Saddler, 2009; Whitt, Edison, Pascarella, Terenzini & Nora, 2001). This could be one reason researchers have become increasingly interested in studying the effect of gender on a number of college outcomes.

While the interest in student satisfaction and GPA research by higher educational institutions has increased, the findings are inconsistent (e.g., Perry, Sekelsy and Skarsten, 2003; Sax & Harper, 2005; Ilias, Abu Hasan, Rahman, & Yoso, 2008; Strayhorn & Saddler, 2009). This study intends to contribute to the existing literature and to our understanding of the effect of gender on students' ACT (American College Testing) scores, satisfaction with major curriculum, and GPA. Moreover, most of the prior studies focus on first year college GPA and satisfaction with college experience, advising or quality of instruction; this study, however, will focus on the senior students' GPA and satisfaction with major curriculum. Moreover, unlike previous studies, this study empirically tests the effect of gender on satisfaction with major curriculum and GPA across colleges and university-wide using a large sample size.

In this paper, a literature review provides support for the development of a model and the hypotheses to be tested in this study. The research methodology, followed by a discussion of the empirical results is presented. Finally, implications and future research directions are provided.

Literature Review

Several studies have been conducted to determine the effect of gender on different issues related to economic, social, political, and managerial issues. This study, however, examines the effect of gender on three college outcomes, namely student satisfaction with major curriculum, students' ACT scores, and college GPA. Research findings on these three college outcomes are briefly reviewed. Satisfaction is a well researched topic across several disciplines including organizational behavior, human resource management, social psychology, and higher education (Hoppock, 1935; Chee, et al., 2005; Weiss, 2002). Research on satisfaction has been conducted in both work place and academic settings. Job satisfaction has been defined in a number of ways by various scholars (e.g., Locke, 1976: 1300; Robbins & Judge, 2008: 83).

The central theme is similar across studies, a positive feeling of one's job resulting from an evaluation of its characteristics. A number of research studies have been conducted to determine the effect of gender on job satisfaction (Weiss, 2002, 2006; Robbins & Judge, 2008). However, the results have been inconclusive.

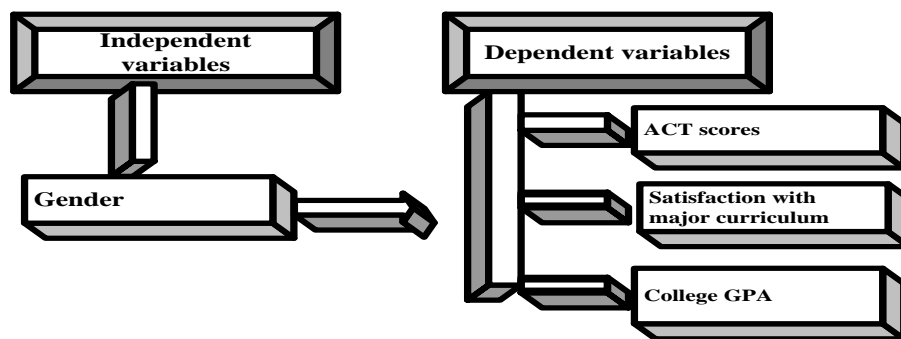
In the academic domain, numerous studies have been conducted to examine the influence of gender on students' satisfaction. While some researchers (LPC, 2009; Perry, et al., 2003; Sax & Harper, 2005; Umbach & Porter, 2002) found that gender has significant influence on student's satisfaction levels, others (Dirkin, Mishra, & Altermatt, 2005; Hong, 2002, Mupinga, Nora, & Yaw, 2006; Witowski, 2008; Ilias, et al., 2008; Corts et al., 2000; Carey et al., 2002; Strayhorn & Saddler, 2009) found no significant difference between male and female students regarding satisfaction.

The second dependent variable used in this study is ACT scores. In differentiating potential candidates in higher education, colleges and universities use standardized tests such as the ACT. The ACT, as a college admission tool, has been used since 1959 and has become one of the most widely used college admissions tests in the U.S. The ACT test has historically consisted of four tests: English, Math, Reading, and Science reasoning. In February 2005, an optional writing test was added to the ACT which measures planning skills in the writing of a short essay. The test is scored on a scale that ranges from 1 (low) to 36 (high) with 36 as the highest possible composite score for reading, math, science, and English (ACT office, 2009). Some studies have concluded that male students tend to have higher ACT scores than female students (ACT office, 2009; Fairtest, 2009; Lei, et al., 1993). According to the ACT office (2009), the composite ACT scores in 2009 for males was 21.3, whereas for females it was 20.9. This difference was the highest recorded difference in over a decade (IES Center for National Statistics, 2010). From 1999-2001, women's ACT composite scores averaged 20.9 compared with male's average scores of 21.1 (IES Center for National Statistics, 2010). In 1991, the difference between male's (20.9) and female's ACT scores (20.4) was three times larger than it was in 2001 (ACT, 2001). Female's ACT scores have shown an increase over time.

The third dependent variable used in this study is college GPA. Some previous studies have found gender to predict college outcomes such as GPA and degree completion (Astin, 1993; Jacobs, 1996). A number of studies also indicate that women tend to have higher GPAs (Chee, et al., 2005; Russell & Lehman, 2008).

In this study, while the above three factors are considered dependent variables, gender is treated as an independent variable. We can, then, determine if gender affects students' ACT scores, satisfaction with major curriculum and college GPA (See Model 1 below).

Model 1: Gender impacting ACT scores, satisfaction with major curriculum and college GPA



Previous studies indicate that female students tend to rate their academic satisfaction higher than their male counterparts. One possible explanation is that female students tend to be more positively lenient in nature than male students (Astin, 1993; Pascarella & Terenzini, 1991; Smith, Morrison, & Wolf, 1994).

Several theories have been developed to explain why female students tend to earn higher GPA's in college than male students (e.g., Chodorow's, (1978) psychoanalytic feminist theory, Gilligan's (1982) theory of women's development, and Coleman's (1988) concept of social capital). Chodorow's (1978) psychoanalytic feminist theory and Gilligan's (1982) theory of women's development conclude that females earn higher GPAs in college than male students because females are more likely to respond and conform to the expectations and norms socialized and sanctioned by close social relationships.

In other words, female students are expected to demonstrate a greater level of conformity to academic standards in general (Chee, et al., 2005). Coleman's (1988) concept of social capital theory also provides a rationale as to why female students earn higher GPAs than male students. Female participation in clubs or groups tends to positively affect female students' academic achievement more so than male students. This assumption was also supported by Chee, et al. (2005). Chee, et al. (2005) argue that female students' higher GPAs probably result from the benefits of their social relationships (i.e., social capital) that contribute to socializing and sanctioning their attitudes and behaviors for learning. Participation in student clubs or groups provides not only a shared group identity but also an additional set of social relationships that may socialize female students into conforming to the academic ethic. Gender differences in the size and implication of social relationships as suggested by Chodorow (1978) and Gilligan (1982) may be the reason that male students may not be influenced in the same manner (Chee, et al., 2005).

From a social psychology point of view, gender differences are a result of *socialization*. Children imitate behaviors they learn in childhood, often those of their same-sex parent or other role model, and develop their self-concept accordingly; these differences are not immutable, however, and have been influenced in recent years by the increasing numbers of women pursuing higher education and entering the workforce (Anderson, 2000). Conversely, other psychologists conclude that peers are the primary source of gender socialization with parents exerting little or no influence (Barnett & Rivers, 2004). Schools are also cited as a source of gender socialization in that "curriculum materials, teachers' expectations, educational tracking, and peer relations encourage girls and boys to learn gender-related skills and self-concepts" (Anderson, quoted by Sax & Harper, 2005). It is interesting to note that the discussions about gender difference are typically framed within the age-old nature vs. nurture debate. To date, research findings have been inconclusive.

Researchers have approached this debate in a plethora of ways. Some studies report that compared to male college students, female college students tend to show more emotional distress (Sax, Bryant, & Gilmartin, 2004; Sax, Lindholm, Astin, Korn, & Mahoney, 2001; Sax & Harper, 2005), resulting in greater investments in required resources in terms of time and attention in order to be successful. Some studies show that some stress level is likely to positively influence performance (Robbins, 2008). Other studies have concluded that female college students tend to have different styles of learning (Baxter Magolda, 1992; Crombie, Pyke, Silverthorn, Jones, & Piccinin, 2003; Sax & Harper, 2005), and when compared to male students, female students tend to choose stereotypically "feminine" majors (Jacobs, 1996). Although the size of the gender gap among college students has generally decreased over time, differences remain in many college outcomes (Chamberlain, 1988; Sax & Harper, 2005). Furthermore, some studies that broadly examine the gender gap on a variety of college outcomes have found that these differences originated prior to college entry and are reinforced during the college years (Sax & Harper, 2005; Whitt, et al., 2001).

Based on our review of the literature, the following hypotheses are proposed:

H1: There is a significant gender difference in overall satisfaction with major curriculum.

H2: There is a significant gender difference in ACT scores.

H3: There is a significant difference in overall GPA by gender.

H4: There is a significant difference in the overall satisfaction with major curriculum across colleges by gender [choice of college can lead to higher female student satisfaction].

H5: There is a significant difference in GPAs across colleges by gender. Specifically, the choice of college can lead to a higher GPA among female students.

H6: There is significant relationship between gender and overall student satisfaction with major curriculum.

H7: There is a significant relationship between gender and ACT scores.

H8: There is significant relationship between gender and GPA.

Research Methodology

Sampling procedure

The data used in this project were based on a survey of the perceptions of senior students on satisfaction with major curriculum collected during the past nine years (2001-2009) at a mid-sized Midwestern public university. To collect the data, the university conducted an electronic survey (through its Institutional Planning, Assessment and Research Office) once a year each spring. The survey was sent to all senior students having 90 or more credits hours.

Sample size

The satisfaction with major curriculum data set has 6,602 respondents. Overall, the response rates ranged from 23-57 percent over the course of the nine-year period as shown in Table 1. However, only 5223 usable respondents or observations were received. Table 1 reports a selective profile of the sample including response rates. It shows that about 30 percent of the respondents were male and 70 percent were female. (At the university, about 40 percent of its students are male and about 60 percent are female). Response rates ranged between 25 percent and 59 percent for female respondents and between 18 percent and 45 percent for male respondents during the survey period (2001-2009). Almost 20 percent of the respondents completed the survey in 2009, which is considerably higher than previous years. Moreover, the student response rate was the highest in 2006 (response rate 57 percent) and the lowest in 2001 (response rate 23 percent) as shown in Table 1.

Table 1 also shows that the data used in this study were collected from the five colleges at the university, namely Business (20.6%), Education (15.2%), Liberal Arts (28.7%), Nursing/Health Sciences (20.9%), and Science/Engineering (14.6%). An analysis of the response sample also shows that response rates in the College of Business ranged between 22.5 percent and 60 percent, in the College of Education ranged between 23 percent and 53 percent, in the College of Liberal Arts ranged between 21 percent and 52 percent, in the College of Nursing/Health Sciences ranged between 14 percent and 76 percent, and in the College of Science/Engineering ranged between 18 percent and 61 percent over the course of the survey (2001-2009) (Table 1). The universe (U) profile somewhat mirrored the respondent population (R) for key demographics (gender and college) during the nine survey years (2001-2009).

Instrumentation/Questionnaire

To assess students' satisfaction with major curriculum, a four-point Likert scale ranging from 1, "Very dissatisfied," to 4, "Very satisfied" was used; students responded to the question, "Overall how satisfied are you with the major curriculum". The bi-polar method used was a forced choice method since the middle option, "Neither satisfied nor dissatisfied", was not available. In addition, the survey included items related to respondents' demographics, such as, gender, college, and year in which the survey was taken. Data regarding the students' ACT scores and college GPA were extracted from the student database at the university and matched to survey responses by the university assessment office. Researchers were provided with a dataset that did not include student names or identifying numbers.

Table 1: Selected Profile of Sample

Variables		N	%	Response rate %
Gender	M	1553	30.0	18-45[†]
	F	3670	70.0	25-59
	Total	5223	100	
Year	2001	261	5.0	23
	2002	367	7.0	28
	2003	482	9.2	NA
	2004	664	12.7	55
	2005	610	11.7	50
	2006	635	12.2	57
	2007	633	12.1	52
	2008	562	10.8	47
	2009	1009	19.3	49
	Total	5223	100	
Colleges	Business	1078	20.6	22.5-60^{**}
	Education	793	15.2	23-53
	Liberal Arts	1498	28.7	21-52
	Nursing/Health Sciences	1094	20.9	14-76
	Science/Engineering	760	14.6	18-61
	Total	5223	100	

‡ The highest response rates for the male students was 45% in 2004 and the lowest response rate of 18.5% was reported in 2002; whereas for female students, the highest response rate was 58% recorded in 2006, but in 2001 the response rate was only 25%. **The highest and lowest response rates for College of Business were recorded in 2007 (60%) and 2001 (22.5%), for College of Education in 2006 (53%) and 23% (2002), for College of Liberal Arts in 2004 (52%) and 2001 (21%), for College of Nursing/Health Sciences in 2006 (76%) and 2001 (14%), for College of Science/Engineering in 2009 (61%) and 2002 (18%), respectively.

Results

This section of the paper provides the major findings that help us to examine the proposed hypotheses. First, we evaluated the effect of gender on satisfaction of major curriculum. The results are shown in Table 2.

Table 2: Effect of Gender on Satisfaction with Major Curriculum (T-test and Cohen’s d effect size)

Gender	n	Mean	SD	T-test p-value	Cohen’s d effect size
Female	3661	3.14	.46	-2.31 (0.021)	0.08
Male	1544	3.10	.48		

Table 2 reveals that both males and females are satisfied with the major curriculum. The average satisfaction for females was 3.14 on a-four point scale and for males it was 3.10 on a-four point scale. Moreover, t-test result show that gender has a significant effect on satisfaction ($t_{5205}=-2.31, p<.05$). Cohen’s d effect size, however, indicates that the size of the effect is small (Cohen’s d effect size=0.08). According to Cohen’s d effect size, below 0.2 is considered a small effect. Support is provided for our first hypothesis.

Table 3: Effect of Gender on ACT scores (T-test and Cohen’s d effect size)

Gender	n	Mean	SD	T-test p-value	Cohen’s d effect size
Female	2755	22.75	3.34	2.29 (0.016)	0.09
Male	1045	23.06	3.39		

Table 3 shows the average ACT scores for female (22.75) and male (23.06) respondents; these scores were higher than the national average ACT scores of 20.9 and 21.3, for females and males, respectively (ACT office, 2009). T-test results also show that male students were found to have significantly higher ACT scores than female students ($t_{3799}=2.29, p<.05$). However, the effect size of gender is small suggesting the observed difference in the means is small (Cohen’s d effect size was 0.09). Our findings support hypothesis 2; male students were found to have significantly higher ACT scores than female students. It could be argued that the current study involves a large sample size which means that statistical differences are more easily detected.

Table 4: Effect of Gender on college GPA (T-test and Cohen’s d effect size)

Gender	n	Mean	SD	T-test p-value	Cohen’s d effect size
Female	3649	3.37	.43	-16.45 (0.000)	0.54
Male	1533	3.13	.49		

Table 4 reports the average GPA for both female (3.37) and male (3.13) respondents. T-test results show that gender does have a significant effect on college GPA ($t_{5182}=-16.45, p<.001$). Cohen’s d effect size also indicates that gender has an effect on GPA (Cohen’s d effect size was 0.54). This result according to Cohen’s d effect size is moderate in size. Hence, hypothesis is 3 supported; female students were found to have higher college GPAs than male students which is consistent with prior research.

Table 5: Effect of Gender on College Satisfaction Level (Two-way ANOVA test)

College	College*		Gender+			
	Least Square Mean**	Std Error	Female		Male	
			Least Square Mean	Std Error	Least Square Mean	Std Error
Business	2.97 ^c	0.014	2.95	0.019	2.97	0.021
Education	3.12 ^b	0.019	3.13	0.019	3.10	0.034
Liberal Art	3.16 ^{ab}	0.013	3.15	0.014	3.17	0.022
Nrs/Hlth/ Sc.	3.21 ^a	0.025	3.22	0.014	3.21	0.048
Science/Eng.	3.21 ^a	0.017	3.22	0.023	3.19	0.024

*Significant differences exist in average overall satisfaction between colleges (p-value = 0.001)

** Colleges with different letters are statistically different in their average overall satisfaction (Turkey-Kramer HSD letterings)

+ There is no significant difference in average college satisfaction between males and females (p-value = 0.626)

As shown in Table 5, a two-way ANOVA model was used to analyze the effect of gender on college satisfaction level. The interaction term between Gender and College was not significant. Moreover, there is statistical evidence to suggest a difference exists in average overall satisfaction across college (p-value = 0.001).

The highest levels of satisfaction were found in the Colleges of Nursing/Health Sciences and Science and Engineering with the lowest satisfaction levels found in the College of Business. However, there is insufficient evidence to suggest that the effect of satisfaction level by college depends on gender (p-value = 0.627). Thus, hypothesis 4 was not supported.

Table 6: Effect of Gender on College GPA (Two-way ANOVA test)

College*			Gender +			
College	Least Square Mean**	Std Error	Female		Male	
			Least Square Mean	Std Error	Least Square Mean	Std Error
Business	3.05 ^d	0.013	3.15	0.018	2.96	0.022
Education	3.33 ^b	0.018	3.44	0.017	3.23	0.032
Liberal Art	3.22 ^c	0.012	3.29	0.013	3.15	0.021
Nrs/Hlth/ Sc.	3.47 ^a	0.024	3.55	0.014	3.39	0.045
Science/Eng.	3.27 ^{bc}	0.016	3.34	0.022	3.21	0.023

*Significant differences exist in average GPA between colleges (p-value = 0.001)

** Colleges are statistically different in their average GPAs (Turkey-Kramer HSD letterings)

+ A significant difference exists in average GPA between males and females (p-value = 0.001)

Table 6 reports the results of a two-way ANOVA model examining the effect of gender on college GPA. The highest average GPA can be found in the College of Nursing and Health Sciences, followed by the College of Education. The lowest GPA is found in the College of Business. However, the interaction term between Gender and College was not significant. This means that we lack statistical evidence to suggest that the effect of College on GPA depends on gender. For example, Nursing and Health Sciences tends to have the highest average GPA for both genders. The effect of college was significant; differences between colleges are labeled with subscript letterings (using Turkey-Kramer HSD letterings). The effect of gender was significant. No letterings are needed because only two groups are being compared here, namely females and males. In addition, there is statistical evidence to suggest a difference in average overall satisfaction across college (p value = 0.001). There is statistical evidence to suggest a difference in the average GPA by gender (p value = 0.001). There is insufficient evidence to suggest that the effect of college depends on gender (p value = 0.319). Hence, hypothesis 5 was not supported.

Table 7: Correlation matrix

Variables	1	2	3	4
1 ACT scores				
2 College GPA	.051**			
3 Satisfaction	.008	.066**		
4 Gender	.041*	-.046**	-.037**	

Notes: ** Correlation is significant at the 0.01 level; *Correlation is significant at the 0.05 level (2-tailed).

Table 7 presents the correlations between the variables included in the analysis. The results show that gender was significantly correlated with students' ACT scores, college GPA and satisfaction with major curriculum. Thus, hypotheses 6, 7 and 8 are supported with our findings.

Discussion

One of the main goals of the current study is to empirically test the effect of gender on some college outcomes, namely students' ACT scores, satisfaction with major curriculum and GPA. Our findings shows that gender had a statistically significant effect on the above three variables, ACT scores ($p=0.016$), satisfaction with major curriculum ($p=0.021$), and GPA ($p=0.000$). A closer look at the findings shows that the effect size of gender on students' satisfaction with major curriculum (Cohen d effect size =0.08) and ACT scores (Cohen d effect size 0.09) is very small, although statistically significant. In the case of the effect of gender of college GPA, however, the size of the effect was moderate (Cohen d effect size=0.54).

Our findings, using college seniors, supports other research, that has primarily used first year college students, in that male students were found to have slightly higher ACT scores than female students (ACT office, 2009; Fairtest, 2009; Lei, et al., 1993), female students were found to rate their satisfaction with major curriculum higher than male students (Perry, et al., 2003; Sax & Harper, 2005; Umbach & Porter, 2002; Carter and McClellan, 2000), and female students tend to have higher GPAs than male students (Chee, et al., 2005, Russell & Lehman, 2008). Moreover, our study indicates that gender is significantly correlated with the three variables included in our model: students' ACT scores ($r=0.041$), satisfaction with major curriculum ($r=-0.037$), and college GPA ($r=-0.046$) (Table 7). The strength of the association, however, is not strong.

Some of the possible explanations for the difference in satisfaction across gender could be female's value systems in that they tend to be more positively lenient in their ratings than male students (Chee, et al., 2005). According to Sax & Harper (2005), women tend to feel more supported by faculty (both academically and personally) than do men, which largely contributes to their greater overall feeling of satisfaction in college. Some possible explanations for why female students tend to earn higher college GPAs would be the tendency of female students to be more serious and disciplined in their studies. Females may feel more overwhelmed and be more stressed than males which could serve to fuel their commitment to perform well academically, resulting in higher grades (Sax & Harper, 2005; Carter and McClellan, 2000). Further, the fact that female students spend less time exercising and playing sports and more time feeling overwhelmed contributes to their lower self-ratings on physical and emotional well-being while in college (Sax & Harper, 2005). Yet, female students are more likely than males to feel that faculty provide them with personal and professional support, according to social capital theory by Chee, et al. (2005), thus accounting for higher levels of satisfaction with faculty, curriculum, and the overall sense of community on campus. At college entry, female students place more value than men on the educational benefits of college (Ilias, et al., 2008). According to Strayhorn and Saddler (2009), the source of gender differences extends back into the pre-college years, where women and men develop different values, confidences, aspirations, and patterns of behavior. The above findings suggest that female students may be more likely than male students to view education as a means to influence social change and advance themselves in the labor force.

An interesting finding of this study is that while male students were found to have higher ACT scores (Table 3), female students were found to have higher college GPAs (Table 4). While this finding regarding GPAs is dependent on majors provided at the institution and enrollments across majors, it contradicts previous studies, in part, which concluded that college outcomes (e.g., GPA) are affected by pre-college experience (Sax & Harper, 2005; Strayhorn and Saddler, 2009); in our study, pre-college ACT scores that were higher for males than females did not predict higher college GPAs for males. One possible explanation is that when female and male students enter college, male students tend to be more relaxed (less serious in their studies) than female students who are more likely to be stressed and work hard, thereby conforming to the sanctioned norms of academic standards (Chee et al., 2005). Females may also feel that by working hard, they will succeed in life, whereas men may view college as a means to an end. Further, women seek to build relationships and would be more likely than men to strive to "please" others, namely faculty, in order to preserve or maintain the relationship. This is supported by social capital theory (Coleman, 1988) and social role theory (Eagly & Steffen, 1984) which argues that people follow expected gender roles in groups (e.g., males play more of a leadership role and females more of a communal role).

Our findings show that the interaction term between gender and college on satisfaction with major curriculum was not significant (Table 5). This means that statistical evidence is lacking to suggest that the effect of college depends on gender.

For example, the College of Science and Engineering tends to have the highest average satisfaction for both genders. The effect of college was significant; thus, differences between colleges are labeled with subscript letterings. No statistical differences exist between genders. Our two-way ANOVA test results indicate that there is statistical evidence to suggest a difference exists in average overall satisfaction across college (p value = 0.001). However, there is insufficient evidence to suggest that the effect of college depends on gender (p value = 0.627). Also, there is not enough evidence to suggest a difference exists in the average satisfaction between genders (p value = 0.611). This is a different outcome than our earlier t-test because college is being considered in this analysis. Statistically, the College of Business had the lowest overall satisfaction. The College of Science and Engineering, Nursing and Health Sciences, and Liberal Arts tended to have the highest average overall satisfaction. Our results generally agree with previous studies (Ilias, et al., 2008; Perry, et al., 2003).

In addition, Table 6 reveals that the interaction term between gender and college was not significant. This means that we lack statistical evidence to suggest that the effect of college on GPA depends on gender. Results from this research both support previous research and bring to the foreground some interesting findings regarding the interaction term between gender and college on students' satisfaction with major curriculum and college GPA.

Conclusions and Recommendations for Further Research

Based on the empirical findings in our study, we can conclude that gender has a significant effect on students' ACT scores, satisfaction with major curriculum and GPA, in spite of the fact that the size effect of gender on satisfaction and ACT scores was small. This study underscores that although the gender gap may have decreased among the college population, a gap remains.

There are several practical implications from our findings that can help guide future research. Although male students tend to have higher ACT scores, they are found to have lower college GPAs. This suggests that male students should be encouraged to perform throughout their college careers, because lower GPAs may impact future labor market opportunities. The labor force is increasingly competitive, as witnessed by the recent increase in females remaining in the labor force during the recent recession and the increased numbers of females graduating with degrees from higher educational institutions. Further, male students may need more support in balancing school and work (Sax & Harper, 2005) which could lead to higher outcomes. Additional research should be conducted to determine the timeframe during the college years that GPAs for males becomes significantly lower than for females. It is not known if this difference occurs from the freshman year and escalates over time, remains constantly lower over time, or if GPA falls off later in the college cycle when major courses are being taken (e.g., junior or senior years). Strategies for dealing with this difference could then be developed.

Moreover, the present study expands previous research [in the effect of gender on some college outcomes] by providing a quantitative assessment of the much-debated "gender issue". It adds to the literature on the "the effect of gender on students' ACT scores, satisfaction with curriculum, and college GPA" in that, unlike most prior research studies, we empirically tested the impact of gender on the above factors using a large sample size collected over nine years with senior college students. Hence, our study has important implications for the theoretical and practical debate on "the effect of gender". That is, this paper attempts to extend the current literature by providing additional findings on the effect of gender on three important variables. These findings are significant for college student affairs personnel, by providing insight into gender differences and students' GPA and satisfaction with major curriculum. These findings should also be of interest to faculty who are preparing future elementary, middle, and secondary teachers. Since one's academic ethic is learned behavior, it is important to recognize that academic achievement in college is rooted in one's early educational experiences (Chee, et al., 2005).

While this study is an important step in understanding the extent to which gender affects the three factors included in our model [ACT scores, satisfaction with major curriculum, and college GPA], it also leaves some questions open for future research. First, this study was conducted in only one U.S. mid-sized university. Hence, in order to generalize and validate the findings of this study, we suggest that a similar study be conducted in other universities both in the U.S. and other parts of the world. That is, additional research is needed to examine the robustness of the findings and generalizations. Second, it is beyond the scope of this research to identify whether particular college experiences can serve to lessen the effects of the pre-college years. It would also be interesting if future research studies attempt to determine the extent to which the gender gap is attributable to nature or nurture.

Future research on this topic should test more explicitly the role that present and future interventions play in reducing longstanding differences between females and males. Third, more research needs to be done with a focus on identifying the factors that led to the difference of the effect of gender on the three factors included in the model used in this study. Fourth, it would be interesting if further research focuses on the effect of gender on pursuing graduate studies. For example, do significant differences still exist when both males and females are planning on attending graduate school because GPA is a measure used in acceptance decisions. Finally, students responding to this survey were predominately Caucasian which limits the generalizability of the findings. Further research could explore the interaction of gender and minority status on the short- and long-term career goals among students.

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