

**Women Students at Coeducational and Women's Colleges:
How Do Their Experiences Compare?**

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Introduction

Are women's colleges as rich with educational opportunity for their students as their proponents claim? Or have they become an anachronistic postsecondary option now that women outnumber and typically outperform men on co-educational campuses?

Few question the valuable role women's colleges played in the history of American higher education. From its beginnings as an enterprise established by men for men, to early experiments in coeducation marked by isolating women and limiting their participation in university life (Miller-Bernal, 2000; Nidiffer, 2001; Solomon, 1985), women were an afterthought. Given this historical legacy, it is just short of remarkable that today women outnumber and in many respects perform better their male counterparts. In fact, they have comprised the majority of undergraduates for more than two decades (National Center for Education Statistics, 2001). Moreover, women are more likely than their male peers to hold high educational aspirations, to enroll in college, and to persist to degree attainment (Bae, Choy, Geddes, Sable, & Snyder, 2000). Though impressive, women's gains in numerical representation and achievement may mask more complex issues of gender inequity in the academy.

Indeed, despite the advances made by women in higher education, some argue that women continue to be treated as "second class citizens" (AAUW, 1992; Holland & Eisenhart, 1990; Riordan, 1992). Since 1982, when Hall and Sandler reported a chilly climate for female undergraduates, the quality of the learning environment for women at co-educational colleges and universities has been a topic of justified concern. Though the evidence supporting the chilly climate thesis is somewhat limited, what does exist suggests that compared with men, many women students' perceive their campus to be less supportive of their academic and social needs and that, as a result, their learning and personal development is adversely affected (Pascarella et al., 1997; Drew & Work, 1998; Rice, 1991). For example, Pascarella and his colleagues found a handful of moderately size negative relationships between perceptions of the campus climate and selected intellectual and personal development outcomes (Pascarella, Whitt, Edison, Nora, Hagedorn, Yeager, & Terenzini, 1997). This pattern persisted through the junior year, wherein students who perceived their campus to be "chilly" had lower gains in writing and thinking skills, science knowledge, and arts and humanities knowledge (Whitt, Edison, Pascarella, Nora, & Terenzini, 1999).

In addition, women students continue to be underrepresented in positions of leadership on coeducational campuses (Astin, 1993) and in the traditionally male-dominated fields of science, mathematics, engineering, and technology (Postsecondary Institutions in the United States, 2001). In part, this may be because women students have qualitatively different leadership styles and experiences during college (Astin, 1993; Kezar & Moriarty, 2000; Whitt, 1994). In addition, females who might serve as role models are underrepresented among senior administrators and faculty positions (Nidiffer & Bashaw, 2001). As these and other micro-inequities accrue over time, they have "a damaging cumulative effect, creating an environment that dampens women's

self-esteem, confidence, aspirations and their participation” (<http://www.bernicessandler.com/id23.htm>). Such inequities are especially marked in areas where women are underrepresented, such as science, mathematics, and technology (Davis, Ginorio, Hollenshead, Lazarus, Rayman & Associates, 1996). In such instances, the paltry proportions of women students in classes contribute to women’s feelings of lack of belonging as learners and to their discomfort in the learning environment. This is particularly true for re-entry women (Hayes & Flannery, 2000) and women of color (Wolf-Wendel, 1998) who are more likely to feel like outsiders because their numbers remain relatively small on the majority of college campuses. With coeducational colleges and universities enrolling 98% of all female students, the learning climate for women collegians on these campuses warrant continuous monitoring, especially compared with women’s colleges, which a considerable body of research suggests provide numerous educational and personal development advantages for their students.

Indeed, single-sex educational environments have been hailed as “models of what institutions dedicated to women can mean” (Smith, 1989, p. 50). With a long history of providing women access to higher education, the nation’s 68 women’s colleges trumpet “taking women’s education seriously” as a core institutional value. Advocates of women’s colleges point to research studies that show these institutions provide a qualitatively superior learning environment for their students (Tidball, Smith, Tidball, & Wolf-Wendell, 1999; Riordan, 1994; Whitt, 1994; Sharp, 1991). For example, women attending women’s colleges are one-and-one-half times more likely to earn baccalaureate degrees in the life and physical sciences or math than women at coeducational institutions (Sebrechts, 1995; Sharpe, 1995). Compared with their counterparts at coeducational colleges and universities, women attending women’s colleges exhibit greater gains in such cognitive areas as academic and intellectual development (Astin, 1993; Baxter Magolda, 1992); academic involvement (National Study of Student Engagement, 2003; Smith, Wolf, & Morrison, 1995; Smith, 1990); intellectual self-confidence (Kim, 2002); and self-perceived academic ability (Kim & Alvarez, 1995). Women at women’s college also evidence gains in non-cognitive outcomes in such areas as self-esteem and confidence (Holland & Eisenhart, 1990; Smith, Morrison, & Wolf, 1994; Astin, 1977) and leadership development (Astin, 1993; Astin & Leland, 1991; Whitt, 1994). Finally, students at women’s colleges are more satisfied overall with their college experience (Langdon, 2001; National Study of Student Engagement, 2003; Smith, 1990) and with their interactions with faculty (Astin, 1993, 1977; Smith, 1990). The lone exception to this litany of positive outcomes is that students at women’s colleges tend to be less satisfied with the quality of social life their campus affords (Astin, 1993; Smith, 1990; Smith, Wolf, & Morrison, 1995).

Assuming that women attending single-sex colleges enjoy educational and personal development advantages, there remains a good deal to learn about the policies and practices that make these institutions distinctively powerful learning environments for their students. Riordan (1994) observed that the impact of single-sex education is still “an unresolved empirical question” (p. 487). After reviewing the literature, Harwarth (1998) concluded there was a lack of quantitative data available to fairly judge the efficacy of women’s colleges and called for additional studies that utilized new databases. For example, many of the more prominent studies of the experiences of women at women’s colleges, such as Astin (1993, 1977), Smith (1990), Smith, Morrison, and Wolf (1994); Smith, Wolf, and Morrison (1995), and Kim and Alvarez (1995), rely on the same data sources, UCLA’s Cooperative Institutional Research Program

Freshman Survey and College Student Survey. In addition, because women are not a monolithic group and their experiences differ (Hurtado, Carter, & Kardia, 1998; Sandler, Silverberg, & Hall, 1996), more research is needed on the impact of college environments on outcomes for women (Whitt, Edison, Pascarella, Nora, & Terenzini, 1999).

Purpose of the Study

This study compares the experiences of women attending women's colleges with those of women attending coeducational institutions. Three research questions guide the inquiry:

1. Do women's colleges differ from coeducational institutions in terms of students' satisfaction with their experiences, the nature and frequency of interactions with peers and faculty members, and participation in a variety of educationally purposeful activities associated with desired college outcomes?
2. Do women's colleges differ from co-educational institutions in terms of the degree to which they emphasize activities that foreshadow deep learning?
3. Do students at women's colleges from different backgrounds (e.g., transfers, women of color) differ in meaningful ways in terms of their college experiences?

Answers to these questions may help institutions identify effective practices that can enhance the quality of undergraduate education for women both coeducational as well as women's colleges.

Methods

The data for this study come from National Survey of Student Engagement (NSSE). The NSSE survey assesses the extent to which first-year students and seniors engage in empirically-derived good educational practices and what they gain from their college experience (Kuh, 2001). Although NSSE doesn't assess student learning outcomes directly, the main content of the NSSE instrument, *The College Student Report*, represents student behaviors that are highly correlated with many desirable learning and personal development outcomes of college.

The sample for this study consisted of 42,112 women undergraduate students who completed the NSSE in 2000, 2001, or 2002. Students from 290 different four-year colleges and universities were represented including 4,676 women at 26 women's colleges and the remainder at 264 other institutions from the same Carnegie categories as the women's colleges (private Master's I & II Universities, Liberal Arts Colleges, and Baccalaureate General Colleges).

Data Analysis

The data were analyzed in two stages. First, we built models to examine the engagement of first-year and senior women at coeducational institutions and at women's colleges. Because of the nested nature of the data and the intent to estimate institutional effects (Raudenbush & Bryk, 2002), we used hierarchical linear modeling (HLM). Using HLM has two advantages over

ordinary least squares regression (OLS). First, HLM allows for the partitioning of variance between the institution and the student allowing for more accurate estimates. In OLS, the variance cannot be accurately partitioned, therefore making it difficult to attribute what is an individual level effect or a group level effect. Second, the inclusion of group-level variables into an OLS regression equation results in the mis-estimation of standard errors and the wrong number of degrees of freedom. For example, if we included a women's college variable our degrees of freedom would be based incorrectly on the 42,112, when in fact it should be based on the 290 institutions in our data. In our example, the probability of making a type II error (i.e. finding significance when actually insignificant) is much greater if we were to use OLS to estimate the women's college effect.

All of the findings of our HLM analyses were done to estimate effect sizes, therefore all of our tables display effect sizes. Effect sizes are useful when assessing the magnitude of the relationship between a dependent and independent variable. An effect size is the proportion of a standard deviation change in the dependent variable as a result of a one-unit change in an independent variable. When we standardize all of the continuous measures (both independent and dependent) in our models, the unstandardized coefficients represent effect sizes. An effect size of .10 or less is considered trivial, between .10 and .30 is small, between .30 and .50 is moderate, and greater than .50 is large (Rosenthal & Rosnow, 1991).

The HLM models included controls at two levels. At the student level we controlled for race and ethnicity, age, enrollment status, transfer status, and major field. At the institution level we controlled for institution type, urbanicity, selectivity (derived from the 2002 *Barron's College Guide*), size, and proportion of full-time students. Second, we built hierarchical linear models using only students from the 26 women's colleges to explore individual differences in engagement within those institutions. With only 26 institutions in this analysis we cannot use group level measures. However, we allowed the intercept to vary, thereby partitioning the variance that can be attributed to the institution. Again, we constructed models for both first-year and senior students.

Multiple dependent measures of student engagement were used. Table 1 displays the factor loadings and alpha reliabilities for the dependent measures, all of which reached acceptable levels ranging from .59 to .80. We created six scales to represent engagement. Academic challenge is composed of 10 items that measure reading, writing, time and time spent preparing for class. Higher order thinking is a subscale of academic challenge and is made up of four measures based on Bloom's taxonomy (time spent synthesizing ideas, making judgments, applying theories, and analyzing ideas) that describe the nature of the cognitive activities emphasized in classes. Integration measures the degree to which institutions emphasize activities that foreshadow deep learning (e.g., discussions of ideas from your readings or classes with faculty members or others outside of class, working on a paper or project that required integrating ideas or information from various sources). The active and collaborative learning measure has seven items (e.g., working with other students in and out of class, asking questions in class, making a class presentation). Student-faculty interaction is a five-item scale covering a range of contacts inside and outside the classroom. Experiences with diversity is a three-item scale that measures student interactions with people of different backgrounds and the emphasis a campus places on encouraging these interactions.

We created four scales from NSSE items to measure students' perceptions of the degree to which their school provided support for their academic and social development. Supportive campus climate is a six-item construct that measures student perceptions of institutional support and the quality of relationships among students, faculty members and administrators. Two supportive campus climate subscales were created, interpersonal support and support for success. Interpersonal support is a three-item measure of the quality of student relationships with faculty, staff, and other students. Support for success is a three-item scale that represents students' beliefs about campus support for academic and non-academic success. Satisfaction is measured with two items.

We included student self-reported gains in our analyses, as many claims about the superiority of women's colleges are related to the degree to which students benefit intellectually and socially from the experience. One self-reported gains measure is a four-item scale that focuses on general education outcomes (e.g., general education, writing, speaking, and critical thinking). A four-item scale represents student gains in understanding self and others. Of the two single item gains measures, one represents quantitative skills and the other one's willingness to contribute to the welfare of their community. The former is of interest because of the literature that suggests women at women's colleges are more likely to excel and pursue graduate study in mathematics and science than women who attend co-educational colleges. The latter reflects the emphasis women's colleges give to community service as an educational value in the curriculum.

Results

Women's Colleges and Coeducational Colleges.

Table 2 presents the results of the hierarchical linear models comparing student engagement at women's and coeducational colleges. In general, women at single-sex colleges are more engaged than women at coeducational institutions. After controlling for both individual and institutional characteristics, both first-year and senior women attending women's colleges reported higher levels of academic challenge. Especially noteworthy is that seniors at women's colleges were more likely to engage in higher order thinking activities than seniors at coeducational institutions. Similarly, both seniors and first-year students at women's colleges scored higher on active and collaborative learning and student-faculty interaction than their counterparts at co-educational institutions. Additionally, both first-year students and seniors at women's colleges were more likely to engage in integrative activities that lead to deep learning. The largest observed difference is related to experiences with diversity. Both first-year and seniors at women's colleges reported that their campus environment encourages and supports diverse interactions and an understanding of diversity to a greater degree than women at co-educational schools.

Students' perceptions of other aspects of the campus environment are somewhat mixed, though. For example, women attending the two categories of institutions did not differ in terms of their perceptions of the overall campus environment. However, seniors at women's colleges perceived a lower level of interpersonal support compared with their counterparts at

coeducational schools, while first-year students at women's colleges perceived greater support for success. No differences were found in terms of student satisfaction.

In terms of gains, women's college respondents reported making more progress in every measure tested. Specifically, women's college students indicated greater gains in understanding themselves and others, general education, ability to analyze quantitative problems, and desire to contribute to the welfare of their community.

Within Women's College Differences.

Engagement in Effective Educational Practices. Table 3 presents individual-level results from the within women's college models of student engagement. Some race- and ethnicity-related differences were found in engagement in effective educational practices. In the senior year, African American and Asian Pacific American (APA) students reported fewer interactions with faculty compared with White students. APA seniors were also less likely than White seniors to participate in active and collaborative learning activities and first-year APA students scored lower on academic challenge. Both first-year and senior APA students indicated less involvement in integration activities than Whites.

We also observed differences related to major field for seniors. Except for active and collaborative learning, students at women's colleges majoring in the social sciences appear to be the most engaged, reporting the highest level of academic challenge, experiences with higher order mental activities, and diversity experiences. Students in professional programs scored high on the active and collaborative learning measure. However, students in professional programs reported the lowest frequency of contacts with faculty members and experiences with diversity. Seniors in math and science and professional programs scored the lowest on engagement in integration activities.

Contrary to national findings that show transfer students are generally less engaged overall (Kuh, 2003), transfer students at women's colleges were as engaged as those who started at and were about to graduate from the same women's college. In some instances they were more engaged. For example, senior transfer students reported higher levels of academic challenge and first-year transfer students reported more integrative experiences.

Supportive Campus Climate. Table 4 displays models predicting women college students' perceptions of their campus climate and overall satisfaction. As with engagement, transfer students perceived levels of support comparable to other students on all four measures.

Compared with White women, senior African American students reported significantly less support, especially for interpersonal support. Also, both first-year and senior African American students were less satisfied than White students. In addition, APA students at women's colleges were less satisfied than their White counterparts.

As with the engagement measures, students' perceptions of the campus climate differed by major field. Seniors in professional majors had somewhat less positive views of the campus

climate and reported the lowest levels of satisfaction. Students majoring in the social sciences reported the most positive perceptions of the campus climate and highest levels of satisfaction.

Self-Reported Gains. Table 5 shows the results from the models of self-reported gains. First-year African American students reported greater gains than White students in general education, understanding self and others, and quantitative skills. Senior African American students reported greater gains in their willingness to contribute to the welfare of their community and senior APA students indicated greater gains than White students in understanding self and others, quantitative skills, and desire to contribute to their community.

Math and science majors had the lowest gains for three of the four measures; however, as expected, they reported the greatest gains of any group in the area of quantitative skills. Social science majors had the highest gains of all majors in general education knowledge, understanding self, and desire to do community service.

In general, transfer students were comparable to seniors who started at the women's college, with one exception; senior transfer students gained less in their commitment to contribute to the welfare of their community.

Limitations

While more than a third (26 of 68) of all women's colleges are included in this study, many highly selective women's colleges do not participate in NSSE and, therefore, are not represented in these findings. It is important to note that only one of the Seven Sisters schools is in our analyses. Perhaps the results would differ if more were included, although a recent study (Pascarella, Wolniak, & Cruce, November, 2003) suggests little or no relationship between engagement in effective educational practices and selectivity.

Another limitation is related to the validity of self-reported gains. As Pascarella (2001) and others point out, gain scores may be confounded by students' entering characteristics. Though Pike (1999) provides some evidence to suggest that gain scores are not significantly related to entering ability, it is possible that women who select women's colleges and co-educational institutions may start at different levels of ability in certain areas which affects the results in unknown ways. Although the concerns about self-reported data are legitimate, the gains measures are only one of several sets of dependent variables used in this study, and the concerns about the validity of self-reported gains should be interpreted in the context of the complete set of findings.

Also, some of the effect sizes are relatively small. For example, most of the effects of women's colleges (see Table 2) range from .10 to .20. At the same time, the pattern and magnitude of many of the effect sizes that favor women's colleges over co-educational institutions cannot be overlooked.

Additionally, self-selection bias should be considered when examining our results. In the college choice process, women who are likely to interact with faculty and engage in

collaborative learning may in fact be selecting women's colleges because they believe single-sex institutions provide an environment that would offer such opportunities. This possible self-selection may bias the relationship between women's colleges and the dependent measures of this study.

Discussion and Implications

The results from this study are consistent with the research studies that show that women who attend a woman's college are significantly advantaged in terms of the nature and frequency with which they engage in educationally purposeful activities and in the progress they make in a variety of desirable outcomes of college. These advantages exist independent of institutional selectivity.

More specifically, women at women's colleges engage more frequently in effective educational practices at levels that exceed those of their counterparts at coeducational institutions. Indeed, on almost every engagement measure, women at single-sex colleges scored higher. They also reported making more progress toward a variety of desirable outcomes of college. Women's colleges also appear to be transfer-friendly, in that the pattern of advantages also held for this group of students who are typically less engaged at other types of institutions. True to their word, these colleges appear to have created a climate where women are encouraged to realize their potential and to become involved in various facets of campus life, inside and outside the classroom.

The advantages of women's colleges are said to be due in part to the availability of more female mentors and role models among the faculty and top administrators; greater opportunities for and participation in student leadership roles; and higher percentages of students enrolled in the traditionally-male disciplines of math, science, and engineering (<http://www.womenscolleges.org>; Langdon, 2001; Tidball, Smith, Tidball, & Wolf-Wendel, 1999). Our findings showing that students at women's colleges interact more frequently with faculty suggest that faculty members at women's college may be more accessible and students have more opportunities to talk with faculty members outside of class than women at co-educational institutions. Mentorship such as providing advice and encouragement, recommendations for awards, internships or jobs, and involving women in research has been shown to have a positive influence on women students, but especially for women in science (Astin & Sax, 1996). Women in science, mathematics and engineering at coeducational institutions are often discouraged from pursuing science as a career because they have few interactions with role models that could support such a choice and perceive that science professors fail to take them seriously (Davis et al., 1996; Seymour & Hewitt, 1997). By establishing conditions that foster student faculty interactions, women's colleges appear to have provided important supports for women in fields where they are underrepresented. This is true, for example, at Sweet Briar College where 60% of its graduates obtain advance degrees, many of them in the sciences.

Results from this study also confirm that first-year students and seniors at women's colleges participate more actively in class, collaborate more frequently with their classmates in and outside of class, and tutor other students more than women at co-educational institutions.

Many have argued that because men are absent at women's colleges, women students at single-sex institutions have unique opportunities to engage in the education process (Langdon, 2001; Sharp, 1991; Neff & Harwood, 1991, Conway, 1985; Women's College Coalition, 1981). Unlike women at coeducational institutions, women at single-sex colleges assume all the leadership roles on campus, form study groups composed only of women, and take charge in laboratory exercises and classroom discussion. Our findings lend further support to Fassinger's (1995) conclusion that classroom conditions at co-educational institutions reduce women's level of participation, whereas women's colleges seem to create classroom conditions in which women students are more likely to be actively engaged.

Students at women's colleges also report greater gains in self-understanding, including learning effectively on one's own and working effectively with others, than women at coeducational institutions. These skills, which are typically associated with career success and leadership, reveal some of conditions that contribute to the high production of leaders from women's colleges (e.g., graduates of women's colleges constitute more than 20% of women in Congress and are 30% of a *Business Week* list of rising women stars in Corporate America). Women's colleges seem to foster an environment that fuels women's understanding of self and others. The second important measure is in regard to women's gains in analyzing quantitative problems. By many standard and self-reported measures of quantitative reasoning, female students tend to report limited gains in quantitative skills in college (see Davis et al., 1996; Tobias,). However, women's colleges seem to have created conditions that support women's development of quantitative skills, and these gains are particularly significant for science and math majors at women's colleges. Again, this lends further insight into the conditions at women's colleges that support women in mathematics and science.

Given the advantages they create for their students' learning and personal development, it would seem that co-educational institutions can learn some things from women's colleges. For example, coeducational institutions can invest more institutional attention to incorporating gender-inclusive pedagogies in all courses, but particularly courses where women are underrepresented, and in creating conditions and programs that help women students develop greater self-understanding. The quality and frequency of student-faculty interaction at women's colleges might also be further examined to understand under what circumstances students at women's colleges are enjoying such high levels of interaction with their faculty. In addition, it would be instructive to discover the policies and practices women's colleges enact to welcome and support transfer students and enable them to thrive socially and academically at levels comparable to students who begin college at the same school.

Clearly, women are the center of attention at women's colleges. Such places should not be overlooked in the college choice process. It is important to note that the advantages of a women's college education do not pertain to only a small set of highly selective institutions, such as the Seven Sisters colleges. Indeed, only one of these colleges is represented in the study. In one sense the under representation of the most selective women's colleges is good news, in that the other women's colleges that are more accessible to and educate a larger proportion of women undergraduates provide programs, policies and practices that, on average, engage their students at high levels.

The programs, policies and practices that effectively engage women at women's colleges should be further examined. For example, one approach to ensure that attention is paid to the development of skills such as analyzing quantitative problems and self-understanding is to design a curriculum around these competencies. Alverno College's "ability-based" curriculum explicitly identifies eight abilities including skills in analysis, social interaction, and effective citizenship that graduates must possess to be successful professionals in their chosen field. Alverno uses these abilities to educate students and to promote individual responsibility for learning during college and throughout life. Faculty members teach to these abilities through the liberal arts core courses and professional specializations. Alverno also has cultivated a culture of collaboration, linking active and cooperative learning activities to its abilities-based curriculum. Classrooms are usually arranged in "pods" (small groups of desks or tables) to facilitate small group discussion.

While women's colleges offer many advantages, they are not without shortcomings and challenges. For example, not all women attending women's colleges have similarly engaging experiences. African Americans and Asian Pacific American students were less engaged and less satisfied with their college experience than their White counterparts. Thus, it behooves women's colleges to attend to the climate for learning on their campuses for students of color. It would be a pity if women's colleges -- with their tradition of providing access to those who have historically been denied educational opportunity -- were unwittingly shortchanging women of color in the educational process. Women of color, older women, lesbians, and women with disabilities may require specifically-tailored institutional interventions to make the campus environment more welcoming. Other "outsiders" such as those for whom English is a second language and those from working class backgrounds may also require focused efforts. With a student population of approximately 28% African American, 8% Latina and a strong Weekend College for working women, Alverno College stands out as an institution that cultivates the leadership potential of women who have been historically ignored or overlooked by higher education, enacting a learning environment that addresses the needs of its women students who come from diverse backgrounds. Other women's colleges should be studied for their unique contributions to women's education. A cultural audit might discover aspects of the cultures of women's colleges that may inadvertently be contributing to the qualitatively different experiences of women on the same campus (Kuh, Schuh, Whitt & Associates, 1991).

Conclusion

As Geraldine Clifford (1993, p. 142), observed, "gender . . . is one of the most potent forces in shaping human institutions, including education." For more than two decades, proponents of women's colleges have asserted that such institutions offer female students a more equitable, and therefore a higher quality, developmentally powerful learning environment (Langdon, 2001; Sharp, 1991; Neff & Harwood, 1991, Conway, 1985; Women's College Coalition, 1981). Our findings support this claim and plainly indicate that single-sex colleges are not an anachronistic postsecondary option for women. On the contrary, in many respects they are models of effective educational practice, institutions that have much to teach other types of colleges and universities that aspire to providing a challenging yet supportive educational environment for all their students.

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Table 1. Factor analysis of dependent variables

	Factor Loadings	
	Senior	1st year
Engagement		
<i>Academic Challenge</i>	($\alpha=.73$)	($\alpha=.72$)
Worked harder than you thought you could to meet an instructor's standards or expectations	0.50	0.53
Preparing for class	0.40	0.43
Number of assigned textbooks, books, or book-length packs of course readings	0.40	0.36
Number of written papers or reports of 20 pages or more	0.36	0.14
Number of written papers or reports of 19 pages or less	0.38	0.33
Emphasize: Spending significant amounts of time studying and on academic work	0.45	0.48
Coursework emphasizes: Analyzing the basic elements of an idea, experience, or theory	0.71	0.73
Coursework emphasizes: Synthesizing and organizing ideas, information, or experiences	0.76	0.77
Coursework emphasizes: Making judgments about the value of information, arguments, or methods	0.70	0.71
Coursework emphasizes: Applying theories or concepts to practical problems or in new situations	0.67	0.70
<i>Higher-order thinking</i>	($\alpha=.79$)	($\alpha=.80$)
Coursework emphasizes: Synthesizing and organizing ideas, information, or experiences	0.82	0.82
Coursework emphasizes: Making judgments about the value of information, arguments, or methods	0.79	0.78
Coursework emphasizes: Applying theories or concepts to practical problems or in new situations	0.75	0.77
Coursework emphasizes: Analyzing the basic elements of an idea, experience, or theory	0.77	0.78
<i>Active and Collaborative Learning</i>	($\alpha=.61$)	($\alpha=.59$)
Asked questions in class or contributed to class discussions	0.50	0.56
Made a class presentation	0.68	0.58
Participated in a community-based project as part of a regular course	0.52	0.44
Worked with other students on projects during class	0.54	0.47
Worked with classmates outside of class to prepare class assignments	0.65	0.62
Tutored or taught other students	0.45	0.55
Discussed ideas from your readings or classes with others outside of class	0.46	0.53
<i>Student-faculty interaction</i>	($\alpha=.76$)	($\alpha=.73$)
Discussed grades or assignments with an instructor	0.72	0.72
Talked about career plans with a faculty member or advisor	0.79	0.74
Discussed ideas from your readings or classes with faculty members outside of class	0.79	0.76
Received prompt feedback from faculty on your academic performance	0.63	0.62
Worked with faculty members on activities other than coursework	0.65	0.61
<i>Diversity Experiences</i>	($\alpha=.64$)	($\alpha=.63$)
Had serious conversations with students of a different race or ethnicity than your own	0.67	0.66
Contributed to: Understanding people of other racial and ethnic backgrounds	0.82	0.82
Emphasize: Encouraging contact among students from different economic, social, and racial/ethnic	0.79	0.79
Supportive Campus Climate		
<i>Supportive campus environment</i>	($\alpha=.78$)	($\alpha=.79$)

Emphasize: Providing the support you need to help you succeed academically	0.74	0.72
Emphasize: Helping you cope with your non-academic responsibilities	0.75	0.74
Emphasize: Providing the support you need to thrive socially	0.76	0.76
Quality: Your relationships with other students	0.53	0.58
Quality: Your relationships with faculty members	0.71	0.72
Quality: Your relationships with administrative personnel and offices	0.65	0.69
<i>Interpersonal Support</i>	($\alpha=.61$)	($\alpha=.67$)
Quality: Your relationships with other students	0.67	0.67
Quality: Your relationships with faculty members	0.81	0.83
Quality: Your relationships with administrative personnel and offices	0.77	0.82
<i>Support for Success</i>	($\alpha=.73$)	($\alpha=.76$)
Emphasize: Providing the support you need to help you succeed academically	0.75	0.74
Emphasize: Helping you cope with your non-academic responsibilities	0.87	0.87
Emphasize: Providing the support you need to thrive socially	0.85	0.86
<i>Satisfaction</i>	($\alpha=.80$)	($\alpha=.79$)
How would you evaluate your entire educational experience at this institution?	0.91	0.91
If you could start over again, would you go to the same institution you are now attending?	0.91	0.91
Self-reported Gains		
<i>Understanding Self and Others</i>	($\alpha=.74$)	($\alpha=.75$)
Contributed to: Working effectively with others	0.72	0.74
Contributed to: Learning effectively on your own	0.77	0.74
Contributed to: Understanding yourself	0.81	0.81
Contributed to: Understanding people of other racial and ethnic backgrounds	0.71	0.73
<i>General Education</i>	($\alpha=.77$)	($\alpha=.79$)
Contributed to: Acquiring a broad general education	0.67	0.68
Contributed to: Writing clearly and effectively	0.85	0.84
Contributed to: Speaking clearly and effectively	0.83	0.80
Contributed to: Thinking critically and analytically	0.80	0.81

Table 2. Results from HLM: Effect sizes for Women's Colleges

Dependent Variable	1st year		Senior	
Engagement				
Academic challenge	0.10	+	0.12	*
Higher order thinking	0.08		0.13	*
Active and collaborative learning	0.14	**	0.16	**
Student-faculty interaction	0.18	**	0.09	+
Integration	0.16	**	0.17	**
Diversity-related activities	0.31	**	0.27	**
Supportive Campus Climate				
Supportive campus environment	0.06		-0.03	
Interpersonal support	-0.02		-0.08	*
Support for success	0.11	*	0.01	
Satisfaction	0.01		0.02	
Self-reported Gains				
Understanding self and others	0.16	**	0.11	*
General education	0.11	*	0.08	+
Analyzing quantitative problems	0.09	*	0.12	**
Contributing to welfare of community	0.13	**	0.08	+

⁺ p<.10, *p<.05, **p<.01

Table 3. Student engagement at women's colleges

	Academic Challenge		Higher-Order Activities		Active & Collaborative		Student-faculty Interaction		Integration		Experiences with Diversity	
	FY	SR	FY	SR	FY	SR	FY	SR	FY	SR	FY	SR
African American	0.01	0.02	0.04	0.07	0.07	0.07	0.07	-0.15 *	-0.05	-0.06	-0.08	-0.09
Native American	-0.32	0.09	-0.27	0.10	0.21	0.42	-0.04	0.54	-0.39	0.23	0.02	0.13
Asian	-0.14 *	-0.03	-0.14	-0.01	-0.30	-0.17 +	-0.10	-0.21 +	-0.27 **	-0.29 **	-0.05	0.09
Latino	0.14 +	0.06	0.17	-0.14	0.19	0.28 *	0.08	0.17	-0.04	0.08	0.18	0.10
Other race	-0.10	-0.57	0.00	-0.44 *	0.34 **	-0.10	0.11	-0.32	-0.19	-0.11	0.17	0.02
Age	0.03	-0.01 **	0.01	-0.05 *	0.01	-0.03	-0.05 +	-0.06	0.00	0.02	0.03	0.00
Major-Humanities	-0.10	-0.29	-0.11	-0.37 **	-0.04	-0.11 **	0.11	0.09	0.04	0.06	0.23 **	-0.24 **
Major-Math and Science	0.06	-0.34 **	0.08	-0.26 **	0.12	0.01	0.16 +	0.02	0.07	-0.23 **	0.16 +	-0.27 **
Major-Professional	-0.02	-0.16 **	-0.03	-0.15 *	0.05	0.20 **	0.05	-0.20 **	-0.10	-0.24 **	0.14 *	-0.32 **
Major-Other	-0.05	-0.11 **	-0.04	-0.10 *	0.06	0.16 *	0.14 *	0.06	-0.04	-0.02	0.11 +	-0.15 *
Greek	0.03	0.13 *	0.04	0.17 *	0.29 +	0.28 **	0.14	0.26 **	0.19	0.15 *	0.35 **	0.16 *
Full-time	0.58 **	0.51	0.32 **	0.29 **	0.46 **	0.07 *	0.36 **	0.46 **	0.51 **	0.39 **	0.16 +	0.23 **
Transfer	-0.04	0.10 **	-0.06	0.06	0.14 +	-0.04	0.17 +	-0.10	0.18 *	0.01	0.00	-0.01

Table 4. Supportive environment at women's colleges

	Supportive Campus Climate			Interpersonal Support			Support for Success			Satisfaction			
	FY	SR		FY	SR		FY	SR		FY	SR		
African American	-0.10	-0.15	**	-0.02	-0.34	**	0.07	0.03		-0.30	**	-0.23	*
Native American	0.11	0.06		-0.05	0.03		0.47	0.08		-0.02		0.20	
Asian	-0.01	0.04		-0.06	-0.08		0.02	0.12		-0.21	*	-0.30	**
Latina	0.09	0.11		0.22	-0.03		0.06	0.19		-0.15		-0.01	
Other race	0.17	-0.25		0.08	-0.23		0.30	-0.23		0.10		-0.30	
Age	0.10	*	0.02	-0.03	0.13	*	-0.04	-0.06		0.09	**	0.13	**
Major-Humanities	0.24	**	-0.07	0.17	*	-0.03	-0.01	-0.07		0.17	*	-0.02	
Major-Math and Science	0.14	+	-0.07	0.13	0.06		-0.09	-0.15		0.05		-0.17	*
Major-Professional	0.17	*	-0.21	**	0.10	-0.13	+	-0.03	-0.23	**	0.11	-0.19	**
Major-Other	0.11	*	-0.05		0.07	0.01		-0.01	-0.09		0.06	-0.05	
Greek	0.24	*	0.24	**	0.33	**	0.12	+	0.18	0.29	**	0.29	**
Full-time	0.14		0.16	*	0.14	0.13	+	0.22	*	0.13	+	0.13	0.13
Transfer	-0.04		-0.05		0.03	-0.07		0.09	-0.04		0.06	-0.02	

+ p<.10, *p<.05, **p<.01

Table 5. Self-reported gains at women's colleges

	General Education		Understanding Self and Others			Quantitative Skills			Community Welfare		
	FY	SR	FY	SR		FY	SR		FY	SR	
	African American	0.12 *	0.10	0.11 *	-0.01		0.22 **	0.16		0.10	0.20 **
Native American	-0.53	0.00	0.03	-0.14		0.07	0.19		-0.43	0.43	
Asian	-0.07	-0.05	0.10	0.20 **		0.07	0.36 **		-0.01	0.15 *	
Latina	0.06	0.08	0.26 +	0.04		0.06	0.06		0.33 *	0.08	
Other race	0.05	-0.41	-0.13	-0.24		0.04	0.02		-0.09	-0.63 *	
Age	0.04	0.04	0.01	-0.03		0.07 +	-0.01		0.01	-0.03	
Major-Humanities	-0.11	-0.14 *	-0.07	-0.19 **		-0.24	-0.53 **		-0.15 *	-0.28 **	
Major-Math and Science	-0.11	-0.44 **	-0.10	-0.25 **		0.56 **	0.33 **		-0.11	-0.32 **	
Major-Professional	0.01	-0.22 **	-0.04	-0.22 **		0.14 +	-0.07		-0.01	-0.27 **	
Major-Other	-0.05	-0.08	-0.02	-0.11 *		0.03	-0.06		0.01	-0.15 *	
Greek	0.07	0.10	0.20 *	0.26 *		0.16 +	0.12		0.36 **	0.23 **	
Full-time	0.25 +	0.21 *	0.19 +	0.20 *		0.29 *	0.14		0.16	0.21 **	
Transfer	-0.11	-0.06	-0.04	-0.11		-0.06	0.08		-0.11	-0.17 *	

+ p<.10, *p<.05, **p<.01