

# **Women's Colleges in the Era of Gender Equity: A Review of the Literature on the Effects of Institutional Gender on Women**

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*For over three decades, the existence of a women's college advantage has been the subject of ongoing debate. Widely cited studies by Tidball and others argue that graduates of women's colleges achieve higher levels of success and are more likely to enter male-dominated fields than female graduates of coeducational institutions. However, a growing body of research suggests that student characteristics, such as socioeconomic status and ability, and institutional characteristics such as selectivity are the confounding variables actually responsible for these results. While the bulk of the evidence supports the existence of differential benefits for women's college and coeducational female graduates, there is a need for further exploration. The questions we should be focusing on now concern causality and application. How do women's colleges benefit students and how can we apply those lessons in higher education? By investigating student learning outcomes, researchers may begin to answer these questions.*

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### Women's Colleges in the Era of Gender Equity: A Review of the Literature on the Effects of Institutional Gender on Women

With the opening of even the most prestigious all-male institutions to women by the early-1970s, it seemed that women's colleges would go the way of the dinosaur. Though many women's colleges have closed their doors or become coeducational, 66 still exist in the United States (Women's College Coalition, 2005). Advocates of women's colleges have long suggested that their graduates receive a greater return on their educational investment than do female graduates of coeducational institutions and the Women's College Coalition trumpets the impressive achievements its member institutions' graduates. However, do women<sup>1</sup> who graduate from single-sex colleges really have an achievement advantage over their peers that attend coeducational colleges? If they do, is this advantage a result of their college education or other confounding factors? Despite the wide availability of coeducational college opportunities for women, these questions remain pertinent in the 21<sup>st</sup> century. As college costs grow in proportion to family income, the choice of a college that will provide the best return on investment becomes increasingly important for potential undergraduates. Students and their families need to have the information to make informed choices and colleges, single-sex and coeducational, need to know how to provide the highest quality education to their students. If the data suggest that women's colleges do provide an advantage to their students, it may be time for coeducational institutions to investigate the mechanism behind these advantages. Likewise, if the data suggest no achievement advantage it may be time for women's college scholars to examine the benefits of single-sex education in a new context.

Postsecondary education has played an important role in narrowing the gender gap, but the gap persists. Despite the fact that

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<sup>1</sup> For the purposes of this review, any references to students, graduates, and achievers are specific to women unless otherwise noted.

women now outnumber men in college enrollments and have achieved numerical equity in many fields, women still make less money than men and are underrepresented in critical areas of the economy, including science, technology, and upper-level management. If women's colleges do give their graduates an advantage, then these institutions offer important lessons for coeducational institutions committed to gender equity at the institutional and societal level. For three decades, researchers have attempted to discern whether women's colleges offer an advantage to their students, and if so how. To answer this question, researchers have focused primarily on comparing the professional and career outcomes of women graduates of single-sex institutions to those of their coed counterparts. Although a few researchers have investigated other aspects of women's colleges, including the effects of women's colleges on student development and the influence of women faculty on female students, the bulk of the existing research continues to explore the effects of women's colleges from the original perspective of "success" in terms of career outcomes.

In this review of the literature, I will summarize the existing debate over the benefits of single-sex education for women and the weaknesses in the existing approaches to this question. I will review the existing literature beginning with Elizabeth Tidball's (1973) well-known paper on the post-baccalaureate achievements of women's college graduates. Second, I will follow the research developments related to differential outcomes for graduates of women's colleges and coeducation institutions. These outcomes include post-baccalaureate achievement, career choice, and professional preparation. In addition, I will discuss the challenges that face researchers interested in this issue and, given the contradictory evidence related to this issue, I will propose a new perspective from which to investigate this question and advance our understanding of the effects of women's colleges. Finally, I will explore the implications of this issue for higher education.

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##### History of Women's Colleges in the United States

Prior to the 1830s education for women beyond secondary school consisted primarily of “academies” and female seminaries (Geiger, 2000). The seminaries offered women enough education to be teachers, but did not provide true collegiate-level work. Georgia Female College (known today as Wesleyan College), which opened its doors in 1836, is widely recognized as the first true college for women in this country (Fox-Genovese, 1997). Mt. Holyoke, the first of the fabled Seven Sisters colleges, enrolled students beginning in 1837 with the goal of providing an education comparable to, but not in imitation of, that available to men (Horowitz, 1984). By the mid-1850s a few women's colleges were emulating the standards set by men's colleges and after the Civil War the best women's colleges were in deed, as well as in word, equal to the men's (Geiger, 2000). Despite the improvement in quality and growth of single-sex institutions, increased opportunities lured ever-larger numbers of women to coeducational institutions (Tidball, Smith, Tidball, & Wolf-Wendell, 1999). In 1880, 81% of college women attended women's colleges, but two decades later only 35% did so (Geiger, 2000). By the end of World War I, women's colleges were in a period of transition, as the old model faded. Public attitudes became suspicious of all-female enclaves and new ideas about female sexuality and the nature of student life pushed an increasing number of students toward coeducational institutions (Horowitz, 1984; Miller-Bernal, 2000). Despite aggressive marketing by organizations like the Women's College Coalition and the continued viability and visibility of elite women's colleges like Smith, Wellesley and Bryn Mawr, many women's colleges have struggled to survive in recent decades (Reisberg, 2000).

##### Origins of the Debate

In 1973 Elizabeth Tidball published the first of a series of studies that claimed women's college graduates were more successful than women graduates of coeducational institutions. Her work is among the most widely cited in the literature on the value

of women's colleges and it began a debate that continues today. No publication on women's colleges, whether for or against, is complete until it has addressed the results of Tidball's research. Consequently, her studies serve as a starting and a focal point throughout this review of the literature.

"Perspectives on Academic Women and Affirmative Action" (1973) was the first of many studies in which Tidball used baccalaureate degree origin research—studies which look for trends in the types of institutions at which successful people received their undergraduate degrees (Knapp & Goodrich, 1952)—to explore the role that single-sex education played in the post-graduate experience of women. Critics of this methodology fault it for using institutions as the unit of analysis rather than individuals (Oates & Williamson, 1978; Rice & Hemmings, 1988; Stoecker & Pascarella, 1991). In other words, there is no way to separate the characteristics that students bring with them to college from the impacts of the college experience. In her overview of this methodology, Wolf-Wendel (1998) acknowledged this weakness but asserted that the "inability to control for individual student input characteristics does not invalidate the results of baccalaureate origin studies, rather it requires the reader to consider the findings of these studies in the larger context of the research literature on the impact of college environments on students" (p. 143).

### Career Outcomes

#### *Post-Baccalaureate Achievement*

Tidball (1973) examined the baccalaureate origins of a sample of 1,116 women highlighted in *Who's Who of American Women, 1966-71*. She concluded that women's colleges produced 2.3 times the number of women achievers, as defined by their inclusion in *Who's Who* which bases achievement primarily on career accomplishments, than did coeducational institutions and that this was largely due to the higher proportion of female role models at women's colleges. The results also indicated that in coeducational institutions, the output of women achievers was inversely correlated to the number of male students. That same year the Carnegie Commission on Higher Education (1973) released its

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report *Opportunities for Women in Higher Education* and concluded that there was a continued need for women's colleges. They found that women in single-sex institutions:

...generally (1) speak up more in their classes, (2) hold more positions of leadership on campus, (3) choose to enter more frequently into such 'male' fields as science, and (4) have more role models and mentors among women teachers and administrators. (p. 5)

A second Tidball and Kistiakowsky study in 1976 found that women with doctorates in the natural and life sciences were more likely to have graduated from institutions with large female enrollments. They concluded that a favorable college climate for women is one in which there are many other women pursuing graduate degrees in a variety of fields.

Advocates of women's colleges touted Tidball's work, but other researchers questioned her methodology and results, in particular her failure to consider student characteristics like motivation and socioeconomic status (Oates & Williamson, 1978; Rice & Hemmings, 1988; Stoecker & Pascarella, 1991). Oates and Williamson (1978) examined the baccalaureate origins of 545 female achievers who received their baccalaureate degrees from 1930-1939 and were featured in *Who's Who in America, 38<sup>th</sup> Edition, 1974-1975*. They suggested that this source was superior to the *Who's Who of American Women* series because it did not apply different criteria for success based on gender. In the initial analysis, Oates and Williamson found that women's colleges graduated 1.9 times as many women achievers as coeducational colleges, a finding that supported Tidball's conclusions. However when Oates and Williamson subdivided the data into three categories representing the highly selective Seven Sisters colleges (Barnard, Bryn Mawr, Mount Holyoke, Radcliffe, Smith, Vassar, and Wellesley), the other women's colleges, and small coeducational colleges, their analysis indicated that the high rate of achievement attributed to women's colleges in total was, in fact, primarily attributable to the affects of the Seven Sisters institutions. Comparison of the non-Seven Sisters and coeducational institutions revealed no difference in the number of

high achieving women produced. Oates and Williamson hypothesized that the higher average socioeconomic level of Seven Sisters students, and secondarily, the higher selectivity of Seven Sisters institutions, were the reasons for their high number of women achievers. However, their study lacked the data to test these hypotheses.

In 1980, Tidball fired back. *Who's Who in America*, she argued, included men disproportionately because women have historically been excluded from professional hierarchies and the high status professions it highlights. She asserted that the use of *Who's Who of American Women* as the population to be sampled recognized a wider definition of achievement and also provided a larger sample size for study (Tidball, 1980). Tidball also responded to critics that suggested that women's institutions were the only collegiate options available to the majority of women in her samples. On the contrary, the majority (73%) of baccalaureate institutions were open to women in 1910 and by 1932 the number of female college graduates attending coeducational institutions was 83% (Tidball, 1980). Furthermore, Tidball suggested that Oates and Williamson (1978) had compared "apples to oranges" by failing to account for selectivity when they compared the achievement rates of the non-Seven Sisters (less selective) colleges with coeducational colleges of all levels of selectivity. Both Oates and William's and Tidball's critiques suggested that the issue was far from settled.

Tidball continued to look at achieving women and in 1985 examined the baccalaureate origins of women in American medical schools. Controlling for initial ability (SAT score), Tidball found that the entry rate of women from single-sex institutions was twice as great as for those from coeducational colleges. The results supported her earlier findings that educational environment is a key factor in the success of women, particularly in non-traditional fields. Additional analysis indicated that the women's colleges in the sample were at a disadvantage, based on resources, equipment, and medical school affiliation, when compared to coeducational institutions. A second study (Tidball, 1986) found similar

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achievement results for women with doctorates in the natural sciences.

Concerned by the failure to control for socioeconomic status in Tidball's original (1973) study of women graduates from 1910 to 1960, Rice and Hemmings (1988) hypothesized that the increased socioeconomic diversity of women's college students might have diminished the disparity between coeducational and women's college graduate achievements. To test Tidball's earlier results and their own hypothesis, they recreated Tidball's study using a larger sample size of graduates over a greater period of time. Rice and Hemmings found that during the 1940s and 1950s the achievement rate of women from women's college was significantly higher than for those from coeducational institutions. However in the 1960s and 1970s the achievement gap, although still present, was no longer statistically significant. Rice and Hemmings concluded that "the promotion of women's colleges as seedbeds of achievement misses the boat by not focusing on the broader implications of increasing the number of women faculty in coeducational schools" (p. 558). Although their concerns for socioeconomic advantage appear justified, Rice and Hemmings failed to control for the enrollment decline in women's colleges that occurred during the 1960s and 1970s, creating questions about the validity of their results (Jacobs, 1996).

Stoecker and Pascarella (1991) were also concerned with the question of institutional affects versus student characteristics and attempted to separate the two. To do this, they used a structural causal model that controlled for pre-college traits including academic achievement, socioeconomic origins, educational/career aspirations, college academic and social experiences, and marital status. Stoecker and Pascarella used Cooperative Institutional Research Program (CIRP) longitudinal data from over 10,000 students surveyed in 1971 and again in 1980. The results of this analysis indicated that controlling for pre-college characteristics and institutional gender (single-sex male/female or coeducational) had no significant impact on women's post-college outcomes. Stoecker and Pascarella's results suggest that Tidball's research may ignore important causal mechanisms in women's

achievement. However, Stoecker and Pascarella acknowledged that their findings do not necessarily contradict those of Tidball's previous studies and describe several possible reasons for the discrepancies. Their study focused on general measures of attainment, while Tidball used specific indices of attainment (inclusion in *Who's Who*, admission to medical school, and natural science doctorates). Stoecker and Pascarella further acknowledged that, "Career prominence may take some time to establish, and our assessment of attainment in the early career [in contrast to the focus of *Who's Who of American Women*] may not be sensitive to this long-term influence of college gender" (p. 404).

In 1994, Crosby et al. performed another analysis of Tidball's (1985) data on female medical school matriculants to test her claim that women's colleges produce greater proportions of high achieving women. Like earlier critics (Oates & Williamson, 1978; Stoecker & Pascarella, 1991) they hypothesized that Tidball's analyses had failed to sufficiently address the potential effects of socioeconomic status on achievement outcomes. Following Tidball's (1980) suggestion, Crosby et al. (1994) compared institutions based on five factors in addition to institutional gender. These predictor variables were: institutional selectivity, medical school affiliation, tuition, size, and mean SAT scores for the student population. They concluded that although institutional gender did contribute somewhat to the achievement of women graduates, the amount of variance accounted for by the other variables was far greater. The careful control of institutional selectivity exhibited in this study provides a significant challenge to Tidball's work and gives significant credence to the arguments against differential achievement. However, institutional gender, although not the dominant factor, did contribute to achievement, suggesting that researchers should not discount its effects entirely. In addition, this study narrowly defined "achievement" in terms of medical school matriculation. Application of this methodology to a broader definition of high achieving women would greatly strengthen the argument that coeducational institutions are just as productive as women's colleges.

The studies of Tidball and others provide consistent evidence to support the hypothesis that women's colleges do produce a higher proportion of high achieving women than their coeducational counterparts. However, increasingly sophisticated analysis of the post-baccalaureate achievement data like that of Stoecker and Pascarella (1991) and Crosby et al. (1994) suggest that connections between post-baccalaureate career achievements and institutional gender may be weak. Although small in number, the findings of these studies suggest that it is time to move beyond post-baccalaureate achievement studies and explore other effects of women's colleges on students.

### *Career Choice*

A number of studies have suggested that women's college students are more likely to choose a non-traditional (male-dominated) major or occupation than women from coeducational institutions (Bressler & Wendell, 1980; Harwarth, Maline, & DeBra, 1976; Tidball & Kistiakowsky, 1976). Tidball and Kistiakowsky (1976) found that women's college students chose non-traditional (male-dominated) occupations at a higher rate than their coeducational counterparts. However, Oates and Williamson (1978) found that high achieving graduates from women's colleges and coeducational colleges were distributed among basic occupational categories in similar proportions. They concluded that there was a difference in the occupational choice of women's college and coeducational institution graduates, but that it was not in terms of traditional versus non-traditional fields. Rather, coeducational college graduates tended to be found in occupations that required certifiable skills, while women's college graduates tended to be found in occupations that did not. It is not clear if Oates and Williamson controlled for institutional selectivity or student characteristics. However, in 1980, Bressler and Wendell studied the career aspirations of male and female undergraduate students in selective coeducational and single-sex colleges, controlling for socioeconomic status and academic ability, and concluded that women at single-sex colleges more often moved

toward male-dominated fields during their college years than women at coeducational institutions.

Lentz (1983) and Solnick (1995) took different approaches to this question. Lentz explored changes in career salience, a measure of career motivation and importance, and Solnick studied changes of major during college. Lentz found that when level of college selectivity was controlled for, changes in career salience from freshmen to senior year did not differ between women's colleges and coeducational colleges. In fact, he concluded that women at coeducational colleges had greater increases in career salience from freshmen to senior year. However, Solnick found that women in a single-sex environment were less likely than those in coeducational institutions to stay in female-dominated fields.

As suggested by Pascarella and Terenzini (1991), the Lentz (1983) and Solnick (1995) studies illustrate the importance of understanding the question when attempting to generalize results. Difference in major, career salience, post-graduate occupation and career achievement are separate but intertwined questions. Existing approaches to this issue have largely fallen into two categories, one for and one against the basic premise that women's colleges produce higher achieving women than do coeducational institutions. These comparisons ignore key differences in the strengths and weaknesses of individual studies and the specific types of questions they explore, as well as their implications.

### *Professional Preparation*

A number of studies have suggested that women's colleges send a larger proportion of women into graduate school and male-dominated fields than do coeducational institutions (Miller-Bernal, 1989; Tidball, 1973; Tidball & Kistiakowski, 1976). However, other studies have contradicted these findings (Riordan, 1992). Kim and Alvarez (1995) found no difference in level of preparation for graduate school based on institutional gender. They also found that coeducational college women had greater job-related skills than women's college students. Likewise, Riordan (1994) found no greater post-graduate educational attainment for women's college students unless they had transferred to a

coeducational institution during their undergraduate years. Ledman, Miller, and Brown (1995) introduced a different perspective when they suggested that women's colleges sent a greater proportion of women to graduate school and that the graduate school experience, rather than the undergraduate institutional gender, was directly related to increased career success. Based on that study, they concluded that women's colleges do have a positive impact on women's career success, but in their scenario undergraduate institutional gender had only an indirect effect on career achievement, with graduate school as the direct link.

### Challenges and Additional Considerations

Despite the literature in favor of single-sex education for women, recent declines in enrollment at many of these schools suggest that many potential students no longer see an advantage in single-sex education (Reisberg, 2000). In this environment, the continued viability of women's colleges is in question. As women's colleges struggle to survive, they face many challenges in public perception. First, there is the perception that women's colleges lack diversity. Casserly (1999) found that they tend to be small and private with a liberal arts focus, consisting of predominantly white, traditional-aged, upper socioeconomic strata students. In this environment, Casserly concluded that these students have little interaction with students of different race, ethnicity, or economic class. Such perceptions can be a significant detriment to institutions catering to an increasingly diverse student body. In contrast to Casserly's characterization, the Women's College Coalition (n.d.), reports that women's colleges have attracted a remarkably diverse student body. According to the Coalition, a national college survey shows that 40% of the top 15 most diverse national colleges are women's colleges. These contrasting perceptions pose a challenge for the continued viability of women's colleges in an increasingly multicultural world.

Another potential challenge to single-sex education is the perception that women who do not gain experience working with or leading men in college are disadvantaged (Casserly, 1999;

Whitt, 1994). Whitt (1994) suggested that this seclusion fails to prepare students for the “real world.” Linda Wertheimer, host of National Public Radio's *All Things Considered* and Wellesley alumna responded to this suggestion by stating (Women's College Coalition, n.d.):

If by real life one means the opportunity to be downtrodden, I think that taking a temporary pass on that is fine. However unreal the world of by-women-for-women, women-can-do-whatever-they-want may have been, it certainly gave me and a lot of women I graduated with the feeling that the world could be and should be different. A lot of us have spent our lives acting on that. (¶ 4)

The argument that a lack of professional interaction with men disadvantages women in single-sex colleges has not been explored experimentally. However, based on the indications of the differential success between women's college graduates and their coeducational counterparts, it does not appear valid. Similar to the issue of diversity, perception is key. It does not matter if women's colleges are superior in preparing women for the “real world” if prospective students perceive that they are not.

As evidenced by this review, the bulk of the research on women's colleges has compared single-sex to coeducational institutions. However, women's colleges are a diverse group of institutions (Tidball, 1989) and a growing number of studies suggest that there is a need to look deeper. In a study of women 30 years after graduation, Duncan, Wentworth, Owen-Smith, and LaFavor (2002) found that those who had attended a single-sex institution with a coeducational learning environment (e.g., Radcliffe College at Harvard) reported higher levels of sexism and more active involvement in the women's movement of the 1970s than those who had experienced a completely single-sex education. Ridgwell & Creamer (2003) compared two southern women's colleges with distinctly different cultural environments and found that institutional environment weighed heavily on student outcomes. In a study that explored institutional race (predominantly White or predominantly minority-serving) as well as institutional gender, Wolf-Wendel (1998) concluded that for

African American women and Latinas, institutional race, followed by institutional gender, were the most significant predictors of success. In contrast to White women, institutional selectivity was not a significant predictor of success for African American women and was a negative predictor of success for Latina women.

As these studies indicate, institutional gender is only one of many potentially significant factors influencing the development and achievements of female students. Relying on broad categories to describe the experience of a group of people provides only a small portion of the complete picture. The oversimplified view of the world presented in coeducational versus single-sex college studies fails to recognize that neither the women within these groups nor the institutions themselves are homogenous. Weiler (1991), in her feminist critique of Freire's *Pedagogy of the Oppressed*<sup>2</sup>, highlighted the limitations imposed by an assumption of a common experience. While Weiler acknowledged that women, as a group, have been oppressed, she stressed the importance of recognizing that different types of women (in her example, based on race) have experienced that oppression in vastly different ways. The importance of institutional race over institutional gender for the women sampled in Wolf-Wendell's (1998) study illustrates Weiler's point.

Despite some resurgence of student interest in women's colleges, particularly the elites, these institutions as a group continue to face a number of obstacles. While these are largely obstacles of public perception, they are also obstacles of self-perception. Future research efforts need to address the diversity of women's colleges in order to fully understand their effects, capitalize on their strengths, and export their successful strategies into coeducational environments.

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<sup>2</sup> Paulo Freire, in his book *Pedagogy of the Oppressed* (1970) and subsequent works, argued for an education in which individuals examined their own lives and circumstances in order to identify and critique systems of oppression and thus liberate themselves and their oppressors from those systems.

## Implications for Practice

### *The Distinct Environment of Women's Colleges*

Although there is continued debate over the direct and indirect effects of women's colleges on student outcomes, research has consistently indicated that women's colleges have a distinct environment. In 1981, the Women's College Coalition reported that women's colleges were unique in several ways: 1) women controlled the institutions and were present throughout the faculty and administration, 2) faculty and staff interpreted their mission as an equity mission, 3) faculty supported feminist teaching goals, and 4) women were present throughout the curricula (Bales & Sharp, 1981). Similarly, Riordan (1994) found that unique women's college characteristics create productive environments for women. Miller-Bernal (1993) pointed out that women's colleges have a greater presence of women on the faculty, provide leadership experience for women, and provide higher levels of support for women.

The academic environment of an institution, whether single-sex or coeducational, affects the student experience in many ways. Stark and Lattuca (1997) stated that a well-developed curriculum must consider students, not as a generic group, but as individuals with goals and needs that may conflict with faculty goals and needs. Faculty and administrators at women's colleges appear to address the goals and needs of women differently than coeducational colleges where traditionally male ways of thinking and learning are rewarded. In their overview of course planning, Stark and Lattuca reported that faculty members in general rarely consider gender. In contrast, the mission and curriculum of women's colleges revolve around the needs of women (Bales & Sharp, 1981). This gender-specific focus may be the key to positive student outcomes in women's colleges.

Equal access to education does not necessarily mean equal experience (Minnich, 1989, 1990; Tidball, et al. 1999). Minnich (1990) wrote:

Mere access to schooling has clearly never been enough, and cannot become so, as long as any remnants of the old

assumptions that we are by nature inferior and out to be educated to serve white men remain within the curriculum, however deeply hidden. (p. 18)

The opening of higher education to women in coeducational settings was momentous and someday it will offer women the same educational opportunities as men. As Minnich (1989, 1990) illustrated, however, the simple addition of women to the existing male-centered pattern of education has been insufficient. Women in this setting are rarely a part of the curriculum; rather they are outsiders looking in.

Despite their dedication to the needs of female students, women's colleges cannot address the history of male-centeredness simply by virtue of sexual self-segregation. These institutions are built on the same academic and cultural foundations as men's colleges. As women's colleges began to blossom at the end of the 19<sup>th</sup> century, many mimicked men's colleges. Some were ahead of their time, for example focusing on modern rather than ancient languages (Geiger, 2000), but the standard was still the classical curriculum of the best men's colleges. While women's colleges have never been entirely independent of the male-centered academic culture, their female-centeredness may bring women into the dialogue in a more meaningful way than their coeducational counterparts.

#### *Areas for Future Research*

Tidball's initial 1973 study on the post-baccalaureate outcomes of women's college graduates stimulated an ongoing debate over the effects of women's colleges. For two decades, researchers debated her methodology and conclusions, refining and re-refining the initial study design, without settling the issue conclusively. This impasse suggests that it is time to reconsider how researchers are asking the question. Rather than focusing on career outcomes, it is time to consider student learning outcomes. The growing national focus on the assessment of student learning outcomes for quality improvement, accreditation, and accountability supports this approach. Researchers should compare the outcomes of women's and coeducational college graduates through objective

measures of student learning, such as performance on the GRE or professional certifications, or through indirect measures such as student self-reports. Although direct measures may not be feasible in all programs, research indicates that self-reported learning can provide a reasonable estimation of actual learning (Laing, Swayer, & Noble, 1989; Pace, 1985; Pike, 1995). Focusing on student learning would allow researchers to measure and compare the most proximal outcomes of the college experience for women's college and coeducational college graduates.

While various studies explore different characteristics of women's colleges that may contribute to student ability and achievement, the causal question has not been deeply probed. For example, numerous authors suggest that the number of women faculty affects women students, but how? If a female-centered curriculum is the key, what does that look like? These are the difficult types of questions that remain to be explored. Feminist theory and the concept of critical pedagogy form a basis from which to start. Feminist theory explores the ways in which women are excluded from the acquisition and ownership of knowledge. It is complemented by the ideas of critical pedagogy, where teaching is viewed as a joint activity of knowledge production, rather than the solitary activity of transmitting knowledge (Giroux, 1992). Like feminist theory, critical pedagogy also focuses on the unbalanced power relationships in traditional teaching practices. It explores and affirms the knowledge of marginalized groups that have not historically been at the center of the educational canon. Giroux (1992) suggested that, "Educators need to encourage students by example to find ways to get involved, to make a difference, to think in global terms, and to act from specific contexts" (p. 106). Empirical evidence of increased leadership opportunity and faculty-student contact at women's colleges and anecdotal evidence of the quality of these experiences suggest that this is exactly what women's colleges are doing that most coeducational institutions are not. If women's college faculty members are working from critical and/or feminist perspectives, by conscious design or not, then this pedagogy may be part of the causal explanation for their outcomes.

## Conclusions

While there is significant debate over the impact of women's colleges on students, both during and after college, the weight of the current evidence suggests that their impact is positive. In their meta-analysis of the available research, Pascarella and Terenzini (1991) concluded:

Net of college selectivity and individual factors, attending a women's college appears to enhance educational aspirations and attainment, choice of sex-atypical (male-dominated) careers, and the achievement of prominence in a field. Although there is little support for impacts on occupational status and earnings generally, graduates of women's colleges are strongly overrepresented in the high-status, male-dominated occupations of medicine, scientific research, and engineering. (p. 601)

Although research results remained mixed during the 1990s, Pascarella and Terenzini came to similar conclusions after reviewing a third decade of research in 2005.

Tidball's work in the 1970s and 1980s started the discussion, but it is by no means finished. While there appears to be a critical mass of data in support of differentials between women's college and coeducational college graduates, there is next to nothing that answers, or even asks, why. Despite the wealth of research stimulated by Tidball's work, research in this area appears to have stalled and many questions remain. The questions we should be focusing on now concern causality and application. How do women's colleges benefit students and how can we apply those lessons in higher education? By investigating student learning outcomes, researchers may begin to answer the "how" question. While the effects of institutional gender are still open to debate, the weight of the evidence suggests that women's colleges have something unique to offer all of higher education. Isn't it time coeducational institutions find out what it is and take advantage of it?

## References

- Bales, S. N., & Sharp, M. (1981). Women's colleges: Weathering a difficult era with success and stamina. *Change*, 13(7), 53-56.
- Bressler, M., & Wendell, P. (1980). The sex composition of selective colleges and gender differences in career aspirations. *Journal of Higher Education*, 51(6), 650-663.
- Carnegie Commission on Higher Education. (1973). *Opportunities for women in higher education: Their current participation, prospects for the future, and recommendations for action*. New York: McGraw-Hill.
- Cassery, K. (1999). An educational advantage for women: Women's colleges. *Journal of Student Affairs in Higher Education*, 8. Retrieved March 12, 2005, from <http://www.colostate.edu/Depts/SAHE/JOURNAL2/1999/AnEduc.htm>
- Crosby, F., Allen, B., Culbertson, T., Wally, C., Morith, J., Hall, R., & Nunes, B. (1994). Taking selectivity into account, how much does gender composition matter?: A re-analysis of M. E. Tidball's research. *NWSA Journal*, 6(1), 107-118.
- Duncan, L. E., Wentworth P. A., Owen-Smith, A., & LaFavor, T. (2002). Midlife education, career, and family outcomes of women educated at two single-sex colleges. *Sex Roles: A Journal of Research*, 47(5-6), 237-247.
- Fox-Genovese, E. (1997). Education of women in the United States south [Review of the book *The education of the southern belle: Higher education and student socialization in the antebellum south*]. *Journal of Women's History*, 9, 203-211.
- Freire, P. (1970). *Pedagogy of the oppressed*. New York: Continuum.
- Geiger, R. L. (2000). The "superior instruction of women." In R. L. Geiger (Ed.), *The American college in the nineteenth century* (pp. 183-195). Nashville, TN: Vanderbilt University Press.
- Giroux, H. (1992). Decentering the canon: Refiguring disciplinary and pedagogical boundaries. In *Border crossings: Cultural*

*workers and the politics of education* (pp. 89-110). New York: Routledge.

Harwarth, I., Maline, M., & DeBra, E. (1976). *Women's colleges in the United States: History, issues, and challenges*. Washington, DC: National Institute on Postsecondary Education, Libraries, and Lifelong Learning, U.S. Department of Education.

Horowitz, H. L. (1984). *Alma mater: Design and experience in the women's colleges from their nineteenth-century beginnings to the 1930s*. New York: Alfred A. Knopf.

Jacobs, J. A. (1996). Gender inequality and higher education. *Annual Review of Sociology*, 22, 153-185.

Kim, M. M., & Alvarez, R. (1995). Women-only colleges: Some unanticipated consequences. *Journal of Higher Education*, 66(6), 641-668.

Knapp, R. H., & Goodrich, H. B. (1952). *Origins of American scientists*. Chicago: University of Chicago Press.

Laing, J., Swayer, R., & Noble, J. (1989). Accuracy of self-reported activities and accomplishments of college-bound seniors. *Journal of College Student Development*, 29(4), 362-368.

Ledman, R. E., Miller, M., & Brown, D. R. (1995). Successful women and women's colleges: Is there an intervening variable in the reported relationship? *Sex Roles: A Journal of Research*, 33(7-8), 489-497.

Lentz, L. P. (1983). Differences in women's freshman versus senior career salience ratings at women's and coeducational colleges. *Review of Higher Education*, 6, 181-193.

Miller-Bernal, L. (1989). College experiences and sex-role attitudes: Does a women's college make a difference? *Youth and Society*, 20(4), 363-387.

Miller-Bernal, L. (1993). Single-sex versus coeducational environments: A comparison of women students' experiences at four colleges. *American Journal of Education*, 102(1), 23-54.

Miller-Bernal, L. (2000). *Separate by degree*. New York: Peter Lang.

- Minnich, E. K. (1989). From the circle of the elite to the world of the whole: Education, equality, and excellence. In C. S. Pearson, D. L. Shavlik, & J. G. Touchton (Eds.), *Educating the majority: Women challenge tradition in higher education* (pp. 277-293). New York: Collier Macmillan.
- Minnich, E. K. (1990). Contextual approaches: Thinking about. In *Transforming Knowledge* (pp. 15-36). Philadelphia: Temple University Press.
- Oates, M. J., & Williamson, S. (1978). Women's colleges and women achievers. *Signs*, 3(4), 795-806.
- Pace, C. R. (1985). *The credibility of student self-reports*. Los Angeles: The Center for the Study of Evaluation, Graduate School of Education, University of California at Los Angeles.
- Pascarella, E. T., & Terenzini, P. T. (1991). *How college affects students*. San Francisco: Jossey Bass.
- Pascarella, E. T., & Terenzini, P. T. (2005). *How college affects students: A third decade of research (Vol. 2)*. San Francisco: Jossey Bass.
- Pike, G. R. (1995). The relationship between self-reports of college experiences and achievement test scores. *Research in Higher Education*, 36(1), 1-22.
- Reisberg, L. (2000, November 10). A crossroads for women's colleges. *The Chronicle of Higher Education*. Retrieved February 12, 2005, from <http://chronicle.com>
- Rice, J. K., & Hemmings, A. (1988). Women's colleges and women achievers: An update. *Signs*, 13(3), 546-559.
- Ridgwell, D. M., & Creamer, E. G. (2003). Institutional culture and the advanced degree aspirations of students attending women's colleges. *College Student Affairs Journal*, 23(1), 77-90.
- Riordan, C. (1992). Single- and mixed-gender colleges for women: Educational, attitudinal, and occupational outcomes. *Review of Higher Education*, 15(3), 327-346.
- Riordan, C. (1994). The value of attending a women's college: Education, occupation, and income benefits. *Journal of Higher Education*, 65(4), 486-510.

- Solnick, S. J. (1995). Changes in women's majors from entrance to graduation at women's and coeducational colleges. *Industrial and Labor Relations Review*, 48(3), 505-514.
- Stark, J. S. & Lattuca, L. R. (1997). *Shaping the college curriculum: Academic plans in action*. Boston: Allyn and Bacon.
- Stoecker, J. L., & Pascarella, E. T. (1991). Women's colleges and women's career attainments revisited. *Journal of Higher Education*, 62(4), 394-406.
- Tidball, M. E. (1973). Perspectives on academic women and affirmative action. *Educational Record*, 54(2), 130-135.
- Tidball, M. E. (1980). Women's colleges and women achievers revisited. *Signs*, 5(3), 504-517.
- Tidball, M. E. (1985). Baccalaureate origins of entrants into American medical schools. *Journal of Higher Education*, 56(4), 385-402.
- Tidball, M. E. (1986). Baccalaureate origins of recent natural science doctorates. *Journal of Higher Education*, 57(6), 606-20.
- Tidball, M. E. (1989). Women's colleges: Exceptional conditions, not exceptional talent, produce high achievers. In C. S. Pearson, D. L. Shavlik, & J. G. Touchton (Eds.), *Educating the majority: Women challenge tradition in higher education* (pp. 157-172). New York: Collier Macmillan.
- Tidball, M. E., & Kistiakowsky, V. (1976, August 20). Baccalaureate origins of American scientists and scholars: The undergraduate institutions from which women have gone on to doctorates differ from those of men. *Science*, 193(4254), 646-652.
- Tidball, M. E., Smith, D. G., Tidball, C. S., & Wolf-Wendel, L. E. (1999). *Taking women seriously: Lessons and legacies for educating the majority*. Phoenix, AZ: Oryx.
- Weiler, K. (1991). Freire and a feminist pedagogy of difference. *Harvard Education Review*, 61(4), 449-474.
- Whitt, E. J. (1994). "I can be anything!": Student leadership in three women's colleges. *Journal of College Student Development*, 35(3), 198-207.

- Wolf-Wendel, L. E. (1998). Models of excellence: The baccalaureate origins of successful European American women, African American women, and Latinas. *Journal of Higher Education*, 69(2), 141-186.
- Women's College Coalition. (n.d.). *Women's College Myths*. Retrieved March 14, 2005, from <http://www.womenscolleges.org/mythsfacts.htm>
- Women's College Coalition. (1981). *A study of the learning environment at women's colleges*. Washington, DC: Author.
- Women's College Coalition. (2005). *Women's College Coalition*. Retrieved March 14, 2005, from <http://www.womenscolleges.org>
- Wright, C., & Wright, S. (1987). The role of mentors in the career development of young professionals. *Family Relations*, 36(2), 204-208.

