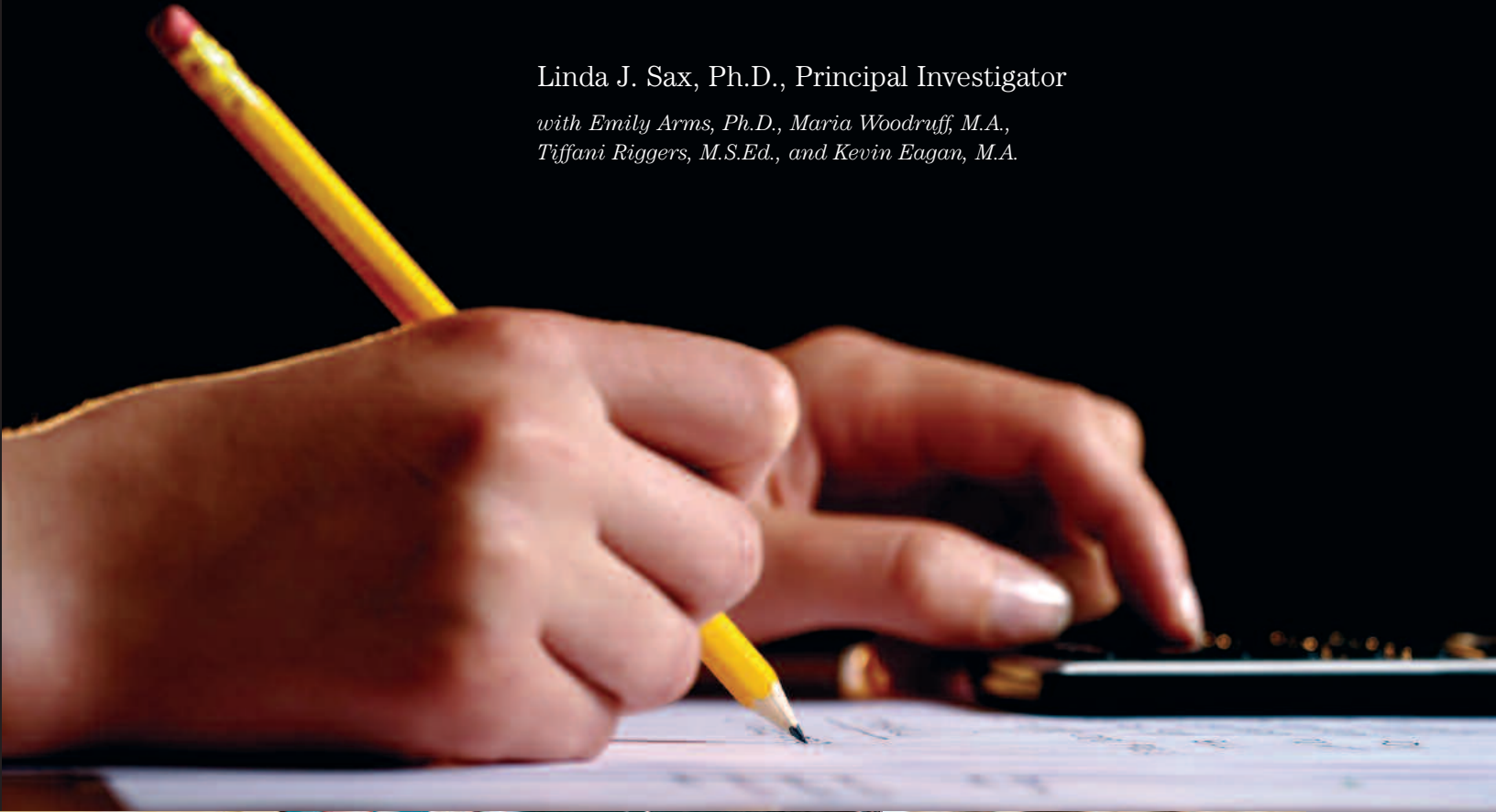


*Executive Summary*

Women Graduates of Single-Sex  
and Coeducational High Schools:  
Differences in their Characteristics  
and the Transition to College

Linda J. Sax, Ph.D., Principal Investigator

*with Emily Arms, Ph.D., Maria Woodruff, M.A.,  
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Associate Professor of Education Linda J. Sax, a 2007–08 Sudikoff Fellow, studies gender differences in college student development, and women in particular, to determine how institutional characteristics, peer and faculty environments, and forms of student involvement may affect women and men college students differently.

“Women Graduates of Single-Sex and Coeducational High Schools: Differences in their Characteristics and the Transition to College,” analyzes the effects of attending single-sex high schools on students’ transition to college. The Sudikoff Family Institute for Education & New Media at the UCLA Graduate School of Education & Information Studies made publication of this report possible.

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# Women Graduates of Single-Sex and Coeducational High Schools:

## *Differences in their Characteristics and the Transition to College*

**I** NTEREST IN SINGLE-SEX EDUCATION has been on the rise over the past two decades, first in the private sector and more recently in the public sector following the U.S. Department of Education's 2006 authorization of single-sex classes in public schools. As opportunities for public and private single-sex education have expanded, the debate surrounding this issue has become more heated. Sex-segregated schools and classrooms are viewed by many as a possible antidote to gender inequities that have been documented throughout all levels of education. Others, however, raise concerns that single-sex settings run the risk of reinforcing sex-based stereotypes and exacerbating gender gaps in educational opportunity.

The ongoing debate over single-sex education has led to greater demand for evidence of its effectiveness. Researchers, educators, policymakers, and the public-at-large are anxious to know whether single-sex education makes a difference, and if so, how, and for whom? Recent reviews of research on single-sex education have concluded that the evidence is mixed, due in large part to the difficulty of attributing differences between single-sex and coeducational students specifically to the *single-sex* nature of their experience. All reviews emphasize the need for more research on single-sex education, especially that which examines a variety of outcomes, uses large and representative samples, and relies on sophisticated methodologies that can disentangle the effects of single-sex schooling from other confounding influences.

Commissioned by the National Coalition of Girls' Schools (NCGS), this report contributes new data to the debate over single-sex education, with a focus exclusively on the experience of female students from single-sex and coeducational high schools. Drawing from the renowned Freshman Survey, an annual, nationwide study of students entering their first year of college conducted by UCLA's Higher Education Research Institute, the study compares the backgrounds, behaviors, attitudes, and aspirations of 6,552 women graduates of 225 private *single-sex* high schools with 14,684 women who graduated from 1,169 private *coeducational* high schools; the database also includes responses of male students, though they are not examined in this report. The research separately considers female students from independent and Catholic school sectors, and distinguishes the effects of single-sex schooling from the role played by other high school characteristics as well as the demographic backgrounds of females who attend all-girls' schools. Due to its large, national sample and number of control variables, this current study aims to make a notable contribution to the research on single-sex education.

# Key Findings

Differences between single-sex and coeducational alumnae were assessed in two ways. The first involved simple descriptive comparisons between these groups within independent and Catholic school sectors, and the second involved a multi-level analysis that accounted for differences in the single-sex and coeducational groups in terms of their background characteristics and features of the high school they attended.

## DESCRIPTIVE RESULTS

The descriptive results reveal significant differences between single-sex and coeducational alumnae. Though generally small, distinctions extend across multiple categories, including self-confidence, political and social activism, life goals, and career orientation. Although future research will need to tell us whether such differences are sustained throughout college and beyond, at least at the point of college entry, most results are favorable to single-sex graduates. These include the following statistically significant differences:

*The descriptive results reveal significant differences between single-sex and coeducational alumnae. Though generally small, distinctions extend across multiple categories, including self-confidence, political and social activism, life goals, and career orientation.*

*Greater Academic Engagement.* Women graduates of single-sex schools exhibit higher academic engagement than do their coeducational counterparts as measured by survey questions on time spent studying or doing homework, studying with other students, tutoring other students and talking with teachers outside of class:

- Nearly two-thirds (62 percent) of women graduates of independent single-sex schools report spending 11 or more hours per week studying or doing homework in high school, compared to less than half (42 percent) of independent coeducational graduates. Study levels are comparatively lower among Catholic school alumnae, though the gap between single-sex and coeducational graduates remains significant (35 percent for Catholic single-sex versus 24 percent for Catholic coeducational graduates).

- Students from single-sex schools are also more likely to engage in group study, with a full 53 percent of independent single-sex graduates reporting that they study with other students on a frequent basis, compared with 45 percent among independent coeducational graduates. Within Catholic schools, this difference is 40 percent for Catholic single-sex graduates versus 34 percent of Catholic coeducational graduates.
- Additional evidence of peer-based academic engagement is seen in the finding that nearly two-thirds (65 percent) of women graduates of independent single-sex schools report frequently or occasionally tutoring other students in high school, compared with 58 percent among women who attended independent coeducational schools.
- Single-sex graduates also report more time talking with teachers outside of class, especially in the independent school sector, where 37 percent of single-sex graduates reported spending three or more hours per week meeting with teachers apart from class, compared to 30 percent among women graduates of independent coeducational schools.

*Women who attended single-sex schools tended to outscore their coeducational counterparts on the SAT.*

*Higher SAT Scores.* Women who attended single-sex schools tended to outscore their coeducational counterparts on the SAT. Mean SAT composite scores (Verbal plus Math) are 43 points higher for single-sex graduates within the independent school sector, and 28 points higher for single-sex alumnae in the Catholic school sector.

*Greater Interest in Graduate School.* Women who attended single-sex schools are slightly more likely than those who attended a coeducational school to say that they are going to college to prepare for graduate school (71 percent to 66 percent) and to choose a college because its graduates are admitted to top graduate schools (45 percent to 41 percent).

*Higher Academic Self-Confidence.* In addition to reporting higher levels of academic engagement, single-sex graduates — especially those from independent schools — tend to exhibit slightly higher levels of academic self-confidence:

- 81 percent of women graduates of independent single-sex schools rate themselves “above average” or in the “highest 10 percent” for academic ability, compared to 75 percent of women graduates of independent coeducational schools.
- Nearly 60 percent of women graduates of independent single-sex schools rate themselves “above average” or in the “highest 10 percent” with regard to intellectual self-confidence, compared to 54 percent of their independent coeducational school counterparts.

*48 percent of women graduates of independent single-sex schools rate themselves “above average” or in the “highest 10 percent” for math ability, compared to 37 percent of women graduates of independent coeducational schools.*

- 64 percent of women graduates of independent single-sex schools rate their writing ability “above average” or in the “highest 10 percent” compared to 59 percent of independent coeducational school graduates.
- 45 percent of women graduates of independent single-sex schools rate their public speaking ability “above average” or in the “highest 10 percent,” compared to 39 percent of women graduates of independent coeducational schools.

*Higher Confidence in Mathematical Ability and Computer Skills.* Graduates of single-sex schools also arrive at college with greater confidence in their mathematical and computer abilities:

- The gap in math confidence is most pronounced in the independent school sector, where 48 percent of female graduates of independent single-sex schools rate their math ability “above average” or in the “highest 10 percent” compared to 37 percent of independent coeducational graduates.
- With regard to computer skills, 36 percent of women graduates of independent single-sex schools rate themselves in the highest categories, compared to 26 percent of women graduates of independent coeducational schools. A similar gap in computer skill self-confidence exists for Catholic school alumnae, with 35 percent of single-sex graduates rating their computer skills as above average or in the highest 10 percent compared to 27 percent of coeducational graduates.

*Greater Interest in Engineering Careers.* Career aspirations are largely similar for graduates of single-sex and coeducational schools, except when it comes to engineering. Single-sex school alumnae are more likely than their coeducational peers to state that they plan to become engineers. The single-sex versus coeducation gap is greatest in the independent schools, where single-sex alumnae are three times more likely than women graduates of coeducational schools to report that they intend to pursue a career in engineering (4.4 versus 1.4 percent).

*Graduates of single-sex schools are more likely than their coeducational counterparts to report that there is a very good chance they will participate in student clubs or groups while they are in college.*

*Stronger Predisposition Towards Co-Curricular Engagement.* Graduates of single-sex schools are more likely than their coeducational counterparts to report that there is a very good chance they will participate in student clubs or groups while they are in college. This is especially true in the independent sector, where 70 percent anticipate involvement in campus organizations, compared to 60 percent of coeducational alumnae.

*Greater Political Engagement.* Female graduates of single-sex schools are more likely than their coeducational counterparts to report that they frequently discuss politics in class and with friends. Political engagement is especially strong at independent schools, where 58 percent of independent single-sex graduates report that it is “very important” or “essential” for them to keep up to date with political affairs, compared to 48 percent of women graduates of independent coeducational schools. Women at Catholic single-sex schools also are more likely to value political engagement (43 percent compared to 36 percent).

## RESULTS OF MULTILEVEL ANALYSES

Though the descriptive analyses reveal more than one hundred statistically significant differences between women graduates of single-sex and coeducational schools, what is most noteworthy is the number of differences that remain statistically significant when accounting for background differences between these two populations, including student demographics (e.g., race/ethnicity, family income, and parental education) as well as characteristics of the high schools they attended (e.g., enrollment and course offerings).

Specifically, the second part of our analyses used hierarchical linear modeling (HLM) to reveal that all-girls’ schools, whether independent or Catholic-affiliated, produce graduates who enter college slightly more academically and politically engaged than



women from similar backgrounds who attended coeducational private schools. Girls' schools also produce alumnae who possess more confidence in their mathematical and computer skills, and are more likely to desire careers in engineering. Additional benefits are found specifically within the Catholic school sector, where attendance at an all-girls' school enhances students' scientific orientation (especially for Latinas), predicts higher SAT scores, and promotes an orientation towards college that is more educationally-motivated and less economically-motivated than is found among female graduates of Catholic coeducational schools.

## Conclusions

**T**his study identifies several areas in which single-sex education appears to produce favorable outcomes for female students, especially in terms of their confidence, engagement, and aspirations, most notably in areas related to math and science. Thus, while the benefits of single-sex education are fairly small, they tend to be in areas that have historically favored men and therefore represent a potentially effective vehicle for mitigating longstanding gender gaps.

Yet, the report also acknowledges that we cannot draw unilateral conclusions about single-sex education, as such determinations depend on which populations are studied, which student and school characteristics are considered, and which outcomes are examined. Thus, the study points the way towards an important research agenda on this topic: How and why do single-sex schools produce positive outcomes and which conditions could be transferred to coeducational schools? Which types of students benefit most from single-sex education? Do the benefits of single-sex education persist throughout college and beyond? In addition, how do the effects of single-sex education compare for males versus females? Attention to these questions using carefully designed and executed studies will add vital context to the ongoing debate regarding public and private single-sex schooling.

*The study points the way toward an important research agenda on this topic: How and why do single-sex schools produce positive outcomes and which conditions could be transferred to coeducational schools? Do the benefits of single-sex education persist throughout college and beyond?*

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# Acknowledgments

A number of individuals and organizations were instrumental in making this report possible. The Higher Education Research Institute at UCLA provided the student data that were essential in conducting the research. We are indebted to the graduate students who worked on early phases of the project, especially Jennifer Curley Mallen, Julie Park, Casey Eznekier Shapiro, and Hanna Song Spinosa. Their efforts were instrumental in crafting the student databases, coding data for thousands of high schools, and conducting preliminary analyses that served as a framework for the present study. Our appreciation also extends to Professor James Catterall of UCLA and Professor Amanda Datnow of UC San Diego, who provided constructive and insightful feedback on the draft report. We also thank Dean Aimée Dorr, Kathy Wyer, and the Sudikoff Family Institute for Education & New Media at UCLA's Graduate School of Education & Information Studies for providing support and resources for the dissemination of this report. Finally, we are grateful to the National Coalition of Girls' Schools, who provided financial support for the development of this report and who have demonstrated a commitment to supporting quality research on single-sex education.

## ABOUT THE AUTHOR

Linda J. Sax is Associate Professor of Higher Education in the Graduate School of Education & Information Studies at UCLA, where she also serves as faculty director of the Master's in Student Affairs program. Dr. Sax teaches graduate courses in research methodology, evaluation of higher education, and gender issues in higher education. She received her B.A. degree in 1990 in political economy from the University of California, Berkeley, and her M.A. (1991) and Ph.D. (1994) degrees in higher education from UCLA. From 1994–2005, Dr. Sax served as Director of the Cooperative Institutional Research Program (CIRP) and Associate Director of the Higher Education Research Institute (HERI) at UCLA, where she oversaw nationwide surveys of college students and faculty.

Dr. Sax's research focuses on gender differences in college student development, and specifically examines how institutional characteristics, peer and faculty environments, and forms of student involvement may differentially affect male and female college students. Her book, *The Gender Gap in College: Maximizing the Developmental Potential of Women and Men* (Jossey-Bass, 2008), explores the impact of college experiences on numerous student outcomes in the areas of academic achievement, self-concept, life goals, career development, physical and emotional health, and political and social attitudes. The book addresses the interests and needs of researchers and practitioners developing student programs and services in higher education.

Dr. Sax was also recently co-principal investigator on a National Science Foundation-funded project to increase women's pursuit of graduate degrees in the physical sciences and engineering.

In addition to having been awarded a 2007-08 Fellowship from the Sudikoff Family Institute for Education & New Media, Dr. Sax is a recipient of the 2005 Scholar-in-Residence Award from the American Association of University Women, and was honored with the 1999 Early Career Award from the Association for the Study of Higher Education. She has authored over 50 publications, including book chapters, monographs, and articles in journals such as *Research in Higher Education*, *The Review of Higher Education*, *The Journal of Higher Education*, *The Journal of College Student Development*, and *Educational Record*. She has served on the Editorial Boards for *The Review of Higher Education* and *Research in Higher Education*.



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*This report was made possible by a gift from the National Coalition of Girls' Schools*

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