



THE EFFECT OF THE CHANGING POLICY CLIMATE ON

**SCIENCE,  
MATHEMATICS,  
AND  
ENGINEERING  
DIVERSITY**

*edited by*

*Shirley M. Malcom*

*Yolanda S. George*

*Virginia V. Van Horne*



AMERICAN ASSOCIATION FOR THE  
ADVANCEMENT OF SCIENCE

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AMERICAN ASSOCIATION FOR THE  
ADVANCEMENT OF SCIENCE

*Proceedings of AAAS Workshop on the  
Effect of the Changing Policy Climate on SME Diversity  
funded by the Alfred P. Sloan Foundation*



AMERICAN ASSOCIATION FOR THE  
ADVANCEMENT OF SCIENCE

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## ACKNOWLEDGMENTS

The Directorate for Education and Human Resources Programs of the American Association for the Advancement of Science (AAAS) is grateful to the Alfred P. Sloan Foundation for its generous support of our forum. Its purpose is multifold: 1) to explore, reflect on, and suggest strategies for positioning the Science, Mathematics, and Engineering (SME) human resources development (HRD) field for transitions; and 2) to address questions on the nature of higher education training — including psychological, educational, and financial support — that is provided to all students. A special thanks to the following individuals for summarizing their personal views on affirmative action into insightful, one-page summaries for use at our workshop: Nancy Carson of Nancy Carson Associates, Beatriz Chu Clewell of The Urban Institute, Daryl Chubin of the National Science Foundation, Denise Dougherty of the American Psychological Association, Ted Greenwood of the Alfred P. Sloan Foundation, Emir José Macari of the Georgia Institute of Technology, and Catherine Morrison of the National Action Council for Minorities in Engineering. This report, of course, could not have been produced without the insight, assistance, input, and participation of AAAS' SME diversity steering committee and workshop participants. It is a summary of the presentations provided at the workshop and the dialogue among the participants. In addition to

attending the workshop, the steering committee proved invaluable by contributing their time to review this report.

This report reflects the diligent teamwork of many individuals. Within AAAS a number of people supported our workshop and the production of this report. Shirley M. Malcom and Yolanda S. George not only developed the idea of this forum but also played pivotal roles throughout — identifying participants as well as relevant papers and reports, setting the agendas, and serving dual roles as facilitators and presenters. Virginia Van Horne coordinated the project, contacting participants, lining up speakers, and serving as liaison between the steering committee and Malcom and George. A special thanks is extended to Paula Lee and Tim O'Rourke for their administrative assistance. Their professionalism ensured the smooth operation of the workshop. Additional thanks to Jennifer Whitfield and Cathy Campos for assisting with the tracking of participants and logistical concerns.

Lastly, special thanks to Reginald Wilson for allowing us to use his overview paper (Appendix I) on affirmative action, to Clifton Poodry for his metabolic pathway model and statement on improving diversity in the Biomedical Research Workforce, and to Eleanor Babco and Catherine Gaddy (Appendix III) for their paper.

The American Association for the Advancement of Science (AAAS) Directorate for Education and Human Resources (EHR) Programs has more than 20 years of experience with programs to increase the participation of girls and women, people with disabilities, and minorities in science, mathematics, and engineering (SME)-related fields. While these programs may have begun as affirmative action/equal opportunity efforts, both the programs and their rationale have matured. We see both of them as an integral part of attending to the health of science and utilizing the full spectrum of the talent pool.

Concerned that the shifting policy climate regarding affirmative action would affect our specific and collective ability to mount effective affirmative action efforts, we requested and received support from the Alfred P. Sloan Foundation to conduct a workshop to examine the changing policy climate and its effect on affirmative action programs. Our goal was not to look for excuses, not to look for rationale for retaining any programming, but rather, to present an opportunity — a forum — in which an honest dialogue could be conducted on how to advance the goal of diversity in SME in the 21st century.

While the SME fields may seem like esoteric and narrow areas, they are in fact at the root of our industry, the engine of our economy, and the basis of wealth creation. We know that if this knowledge is not available to all segments of the community, we will not have the mechanisms for equality or for changing and empowering communities. Science and technology support the quality of life we enjoy in the United States. We believe the stakes are high for developed as well as developing countries and developing communities. Our ability to strengthen communities and to build an educated and technically savvy workforce in those communities must be maintained.

These issues compelled us to hold our forum and subsequently produce this report of recommendations. Our intent is to disseminate this report to educators and to those community, foundation, government, and business leaders who design, implement, and fund education and career pipeline programs.

Over the course of two days, 41 individuals from the business, government, education, policy, and nonprofit arenas engaged in far-ranging discussion in order to work through the difficult issues of understanding the changing policy climate for SME diversity and what can be done with respect to diversity. We looked at the issues of science, diversity, and fairness, and we determined what we thought was needed. We examined higher expectations; system-wide problems such as low-level curriculum and teacher preparation; and even touched upon the dissonance of research, policy, and reality.

During the course of our workshop, we covered topics such as education, employment, and advancement. We also examined the differences between targeting women and targeting minorities. We looked at alternative ways to direct affirmative action programs, such as geographically, institutionally by type, and by economic disadvantage. However, we found them to be weak surrogates for achieving diversity goals. For example, concentrating on certain states or cities may work for minorities since they tend to live and work in certain geographical regions, but women are everywhere! Institution-based programs will address only some of the issues of diversity in science, mathematics, and engineering.

In the past, educators and policy makers have struggled with defining affirmative action goals and designing remedies. In creating these remedies, we have also created dichotomies, such as the following:

- Do we want to enrich the talent pool, or do we want to affect the outcomes of remediation?
- Do we believe that women and minorities should be enabled to compete, or are they entitled to a level playing field?
- Do we want programming that affects institutions, or do we want programming that targets individuals?
- Do we want supportive environments created through model programs, or do we want systemic change?

The questions are often much easier to frame than to answer. Perhaps community tensions are inevitable for a country whose motto is “out of many, one” — a country that still struggles to define its meaning and its reality. Results of these two-day discussions are presented in:

- the preface presented by Shirley M. Malcom, which appeared in *Science* magazine, March 29, 1996;
- Chapter 1 on *Rethinking Approaches to Affirmative Action*, which summarizes the history and definition of affirmative action and also provides suggestions and guidance from educators and policy makers;
- Chapter 2, which summarizes recommendations from the forum; and
- Chapter 3, which provides future needs and directions for college- and university-based affirmative action programs.

Research reports, commissioned papers, and a list of forum attendees are provided in the appendices.



## Science and Diversity: A Compelling National Interest

### PREFACE

Recent Supreme Court rulings and proposed legislative initiatives in opposition to affirmative action threaten to polarize and derail healthy discussions about the use of “group-sensitive” policies and practices to promote diversity, equal opportunity, and inclusion in education, employment, and advancement. In 1995, the Supreme Court ruled in a 5-to-4 decision that governments must demonstrate a compelling interest to warrant set-aside contract programs. That is, government must show exacting proof of past discrimination or have the remediating program struck down. In the aftermath of the Supreme Court decision in *Adarand Constructors, Inc. v. Peña, No. 93-1841*, President Clinton requested a review by all agencies and departments of the federal government of programs that contain race- and gender-conscious provisions (1). In 1995, Senator Robert Dole requested a compilation by the Congressional Research Service (2) of any laws, regulations, or executive orders that appear to prefer or consider race, gender, or ethnicity as factors in federal employment or the allocation of federal contracts or grants. He later offered legislation (S. 1085) as a complement to a House bill (H.R. 2128) to end activities that relied on so-called preferential treatment in the aforementioned areas.

Because of special efforts that have been made to increase the participation of women and minorities in science and engineering, like it or not, these communities have been drawn into this debate. In the spirit of rational debate, we need to examine the social history that brought about the laws and regulations that are now under scrutiny and attack; to explore their intent and impact in science, engineering, and science-based fields; to assess the current status of the targeted groups; and to suggest future actions that compel a more diverse and inclusive science and engineering community.

Affirmative action has no clear and widely accepted definition. It has emerged as a piecemeal collection of laws and executive orders accumulated over a period of more than 50 years. Affirmative action was created as a way of responding to policies and practices that historically supported discrimination, in order to remove structures that kept unequal access in place (3). It included such practices as notifying women’s and minority groups about job openings, advertising openings rather than relying on word of mouth, developing recruitment procedures, promoting a more open process aimed at women and minorities as well as other qualified applicants, and providing equal opportunities for advancement. Over the 1960s, presidential executive orders became more emphatic as the situation of women and minorities changed very little; these orders moved from encouraging inclusion to insisting on it for those who would do business with the federal government. The executive order by President Nixon required that an affirmative action plan that included numerical goals and timetables be developed. Affirmative action certainly never required the hiring of unqualified persons. Instead, it allowed race or gender (or both) to be considered when looking among candidates who were otherwise comparably qualified when judged by previously determined job-related criteria (1, 4).

The process of goal setting began with an analysis of the potential applicant pool from which the employer could draw. The increasing number of women graduating with degrees in the sciences and engineering since the mid-1970s has swelled the pool of available candidates in many fields. Thus, for women in science the problem has largely been one of “letting us in” rather than a shortage of qualified candidates. For minority women, both sets of constraining forces have interacted.

The system of job search became fairer to everyone as a consequence of affirmative action. For example, in the mid-1960s it was typical for there to be only one or two pages of classified advertisements for job positions in *Science*. By the mid-1970s, there were two to three times as many personnel listings. *Science*, being widely read, provided a way for universities and businesses to reach more people and to satisfy affirmative action and equal employment opportunity requirements. The effect was positive for all job seekers and for the health of the scientific enterprise. Although it is also true that the overall number of faculty in science and engineering likely increased during this time because of the expansion of federal support for R&D and increased numbers of students as the Baby Boom generation entered college, Rossiter (5) has documented the earlier use of “informal” recruitment mechanisms that for many years served to exclude women.

Minorities’ access to the powerful institutions of society was limited by a lack of education and contacts that could only be addressed by ensuring those groups’ access to quality education and to the most distinguished programs. But separate and unequal conditions made this difficult for many (6, 7). Jim Crow was not just a product of 1940s and 1950s America. As a student, I attended schools segregated by law. When I graduated from George Washington Carver High School in Birmingham, Alabama, in 1963, attendance at my state’s flagship research university was not a viable option open to me.

Women’s colleges and minority institutions have provided supportive environments for student participation in the sciences and engineering. Traditionally black institutions have historically made a disproportionate contribution to science degrees awarded to African American students. In 1991, 48% of bachelor’s degrees in the physical sciences were awarded to African Americans by historically black colleges and universities (HBCUs). HBCUs awarded 46% of all degrees in mathematics, but only 28% of all bachelor’s degrees to African American students (7).

In the case of science and engineering, special programs and targeted efforts were often developed to enhance educational opportunities and to introduce underparticipating groups to science and engineering careers and provide them with experiences to encourage

and support involvement in fields where there was a weak history of participation (8). Industry led the effort to increase the participation of minorities in engineering education, driven initially by affirmative action requirements that applied to federal contractors. Building on grassroots efforts since the early 1970s, programs for precollege intervention, undergraduate retention and scholarships, and graduate education now work more or less seamlessly in a national engineering initiative. Businesses have continued to participate in these efforts and to promote efforts to bring women into engineering because they see that such activity is good for business.

The focus of the Professional Development Program (PDP) of the University of California at Berkeley, established in response to affirmative action requirements, extended from precollege education through faculty advancement concerns. Components emerging from the PDP experience, such as Uri Treisman’s calculus program (9), have received wide acclaim as being effective in supporting minority student success. Not surprisingly, the strategies employed in PDP (smaller classes, focused group work, challenging assignments, tutoring assistance, and expectations of success) are found to work for majority students as well (10).

Those who were already well-credentialed and well-prepared needed different policy remedies that focused on participation and advancement, because for them there was a history of systematic exclusion and denial of opportunity. HBCUs offered the only opportunity for academic employment for black scientists for many years. In 1941, a survey of predominantly white colleges and universities revealed only two black faculty, both in nonteaching laboratory positions. With the exception of women’s colleges and minority institutions, blacks and women continued to be underrepresented on the faculty of colleges and universities through the late 1980s (6).

Industry was not much better as an employer in pre-affirmative action America. Women were largely invisible in industrial science and technology. Where present, they were relegated to stereotypical roles with limited potential for upward mobility (11, 12). African Americans and women were not the only groups that faced discrimination and denial of opportunity within the sciences. American Indians and Latinos also faced

barriers that denied them access to education, employment, and advancement.

It was conditions such as these that led to passage of laws (variously referred to as civil rights, equal employment opportunity, or anti-discrimination and affirmative action requirements) that seek to address the range of problems faced by groups attempting to join the mainstream of U.S. life and the U.S. economy. In covering educational institutions and employment generally, these laws do affect science and engineering. In addition, the Equal Opportunity in Science and Engineering Act of 1980 (Title 42 of U.S. Code § 1885-1885d) specifically directs the National Science Foundation (NSF) to undertake programs to increase participation by underrepresented groups and to promote the advancement by these groups in science and engineering fields. Although NSF was given considerable latitude in developing programs to accomplish these goals, it must do so while balancing legislative intent and judicial decision, to design efforts that are effective in addressing the targeted groups and capable of withstanding tests of "strict scrutiny" and "narrow tailoring."

The policy changes, especially those of the past 25 years, have made a difference. New laws, court rulings, shifting attitudes, and special initiatives resulted in changes in the general and the scientific community. Women's participation in education and careers in science and engineering shot upward, although it did more in some fields (such as psychology) than in others (such as physics). Once the quotas setting the maximum numbers of women that medical school programs

would accept were removed, these numbers also exploded (Fig. 1). Minorities also increased their participation in medicine, although the increases have been much more modest. However, research suggests that minority physicians make a disproportionate contribution to the health care of poor and minority populations (13). In view of the compelling national need to address the dire health conditions that afflict these groups (14), I would argue strongly that a targeted effort to increase participation is in all our best interests.

Doctorate attainment is increasing, but problems still exist. The science and engineering faculties of our major research universities remain overwhelmingly white and male; and women are overrepresented among the part-time, nontenure-track faculty and underrepresented among full professors. Our industries, universities, hospitals, law firms, and financial institutions still have glass ceilings, residual effects of our history of exclusion. When field, rank, sector of employment, and years of experience are held constant, women still earn less than their male counterparts (7). Minority doctoral attainment still remains below the levels needed in different sectors of society, as evidenced by the 949 Ph.D.s awarded in science and engineering in 1994 to African American, American Indian, and Latino citizens (7, 15). These numbers are hardly sufficient to meet the demands of higher education institutions in search of diverse faculty to serve their increasingly diverse student populations; of industry, which has come to recognize the marketplace value of diversity when competing in a global environment; of science, which must serve the needs of a pluralistic society; or of a country in a

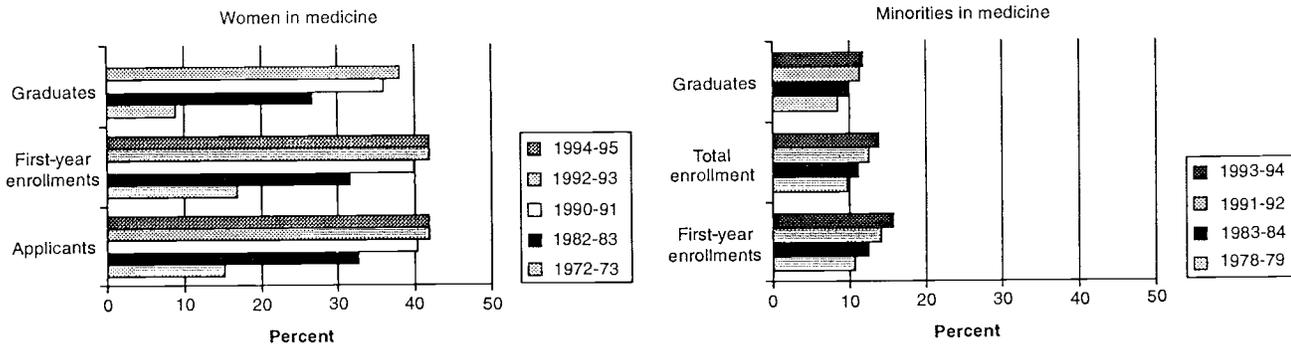


Fig. 1. Participation in medicine by women and minorities during the post-affirmative action decades.

continual quest to realize its democratic ideals.

Critics of affirmative action and of special and targeted programs claim that these strategies have outlived their usefulness, or that they have done their job, or that they have been ineffective, depending on the situations and populations being discussed. Many individuals, although sympathetic to affirmative action, argue that actions to increase categorical participation are inappropriate in a time when so many individuals in science and engineering are unemployed or underemployed. Others complain that such programs discriminate, claiming that programs that address wrongs they themselves did not commit are unfair.

Individual court cases are replete with imperfectly developed program responses to the goals of affirmative action (4). Overly mechanistic and unnuanced responses have produced problems, for example, when women or minorities were added to the pool to “satisfy the numbers,” when good faith was not employed, or when a “token” individual was brought on board. There has also been less than vigorous enforcement of laws and executive orders. I contend that failures in implementation are not to be confused with the worth and value of policy. The complex challenges that science and engineering face require that the full range of human resources, education, and literacy concerns be addressed. Special targeted programs need to remain a part of human resources policy for some time to come, as mainstream programs do not yet serve our aims of excellence and diversity (16). However, they must be coupled with strategies that lead to structural changes that make targeting unnecessary rather than just unpopular or impolitic.

Structural change in higher education would involve such measures as stronger emphasis on improvement of introductory-level courses, promoting interactions with science and engineering professionals, promoting student success rather than student selection, addressing the needs of students for career advice and mentoring, and providing opportunities for students to do research as undergraduates and to see the connections between science and technology and the needs of their community and the larger society (17). Structural change would also entail better integration of research and education in our universities. Policy-makers can support such integration by including and using criteria

that recognize the value of human resource development along with the quality of the ideas and researchers, especially in support of major research centers. An exciting program at the University of Maryland in Baltimore County described in an earlier special issue of *Science* (18) shows how thoughtful experimentation can lead to a program that supports excellence and diversity with a growth of overall institutional quality. We need more efforts by more institutions to show the various ways to support this compelling national interest (19).

As employers, universities and industries must be sensitive to the need to assist faculty and staff in addressing their personal as well as professional needs (such as childcare, elder care, relocation, and spouse employment, as well as lab space and access to equipment) (20). They need to be sensitive to the kind of workplace climate that is created, the types of activities that are rewarded as core contributions to the mission of the institution, and the extent to which the system of rewards is made clear to all who must live under it.

The mood of the Congress, state legislatures, and state boards makes us aware that challenges to special programs are imminent. A struggle is currently under way in the University of California system to alter the rules governing the use of affirmative action in admissions and employment that will likely spread to other public institutions in other states. For program implementers a new urgency exists to reexamine what we are doing. We must revisit, review, and revise, when necessary, special programs to promote fairness and inclusion.

Some institutions, sensing the mood in the country, may choose to “preemptively close” their special programs. Some employers, unwilling to be honest with applicants about their capabilities and skills, will use affirmative action as a convenient excuse to explain hiring or promotion decisions. Other institutions, understanding history, looking toward the future, and possessing a commitment to realize science’s uncommon values of openness, quality, and inclusion, will work toward building the kind of community that supports and affirms participation from the entire pool of talent. These institutions and their leaders will reexamine the incentives set out for their managers, executives, and faculty. They will seek to define and develop the range

of skills and capabilities they need in their work force. They will look at their departments, programs, projects, and classrooms to see not only who is there but also who isn't. They will remove the psychological, physical, and policy barriers to participation. They will do this not for the benefit of any particular group, nor because of laws and policies that either require or forbid certain actions; but to ensure the future health of science and engineering in the United States.

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## ACRONYMS

- AAAS** • American Association for the Advancement of Science
- AAHE** • American Association for Higher Education
- AAMC** • Association of American Medical Colleges
- ACE** • American Council on Education
- AWIS** • Association for Women in Science
- CEHR** • Committee on Education and Human Resources
- CPST** • Commission on Professionals in Science and Technology
- EHR** • Education and Human Resources
- EPSCoR** • Experimental Program to Stimulate Competitive Research
- ESEA** • Elementary Secondary Education Act
- FCCSET** • Federal Coordinating Council for Science, Engineering and Technology
- GEM** • Graduate Engineering Degrees for Minorities
- HBCU** • Historically Black Colleges and Universities
- HBCUs/MIs** • Historically Black Colleges and Universities/Minority Institutions
- HPPI** • Health Professions Partnership Initiative
- IHP** • Investing in Human Potential
- MARC** • Minority Access to Research Careers
- MBRS** • Minority Biomedical Research Support
- NACME** • National Action Council for Minorities in Engineering
- NASA** • National Aeronautics and Space Administration
- NCTM** • National Council of Teachers of Mathematics
- NIH** • National Institutes of Health
- NIM** • National Institute on Mentoring
- NRC** • National Research Council
- NSF** • National Science Foundation
- NSTA** • National Science Teachers Association
- PDP** • Professional Development Program
- PI** • Principal Investigator
- R&D** • Research and Development
- SME** • Science, Mathematics, and Engineering
- SMT** • Science, Mathematics, and Technology
- URP** • Undergraduate Research Programs
- WEPAN** • Women in Engineering Programs Advocates Network

## CHAPTER 1.

# *Rethinking Approaches to Affirmative Action*

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In the late 1960s and early 1970s, diversity in science and engineering became a public policy issue. Spurred by the larger efforts to achieve civil rights for African Americans as well as for other American racial and ethnic minorities, and joined by the women's movement, scientific and engineering communities launched major activities to diversify their ranks. Interest in civil rights and equal employment/affirmative action requirements for companies doing business with the federal government also came at a time of declining college and university enrollments in engineering, which increased the interest of the engineering education community in opening its doors. However, a great deal of confusion currently exists about affirmative action. This confusion is affecting programs operated by both government agencies and colleges and universities.

In Appendix I, Reginald Wilson, Senior Scholar at the American Council on Education (ACE), presents a history of affirmative action that takes us from the establishment of the Freedman's Bureau in 1865 to today. In his opening paragraph he states:

*Affirmative action has had a long and contentious history dating back many years in the United States. It began haphazardly without a clear sense of its final scope or full intent and evolved into the present complex of laws and executive orders. However, the purpose was always clear: to overcome the history of America's past of slavery, peonage, racism, and finally, legally sanctioned segregation, that barred blacks (and other minorities and women of all races) from full participation in the work force and in America's educational institutions. The segregation was systemic and nearly complete. Such exclusion, especially of blacks, contradicted the lofty statements of the Constitution and Declaration of Independence*

*and was a blot on the conscience of many Americans. These barriers have been deeply embedded in the attitudes and institutional structures of American society since the founding of the nation. Although many attempts have been made to eradicate these barriers, their attempted removal has been met with equally fierce resistance (1).*

In the *Affirmative Action Review: Report to the President (2)*, the result of a five-month White House study on federal affirmative action programs, the following definition was offered: "affirmative action is any effort taken to expand opportunity for women or racial, ethnic and national origin minorities by using membership in those groups that have been subject to discrimination as a consideration." Thus, affirmative action is intended to accord protection to people in special groups as specified by law, regulations, court decision, or executive order. It sets forth specific goals for hiring, training, compensating, and promoting members of protected groups, helping to ensure that discrimination does not occur (3).

### **Legislative and Policy Activities for and against Affirmative Action**

Current legislative and judicial discussions and actions have sparked a wave of concern and confusion among educators and policy makers, leaving many organizations uncertain about the future of even current racial, ethnic, and gender-based programs. These conflicting activities and actions include the following:

- congressional efforts to "roll back" legislation concerning affirmative action;
- President Clinton's commissioned report and subsequent policy statements in defense of affirmative action (2);

- the University of California Board of Regents' ban on affirmative action;
- court cases such as *Adarand Constructors, Inc. v. Peña*, in which the U.S. Supreme Court ruled that many federal affirmative action programs be reviewed by the courts using "strict scrutiny" as well as stating the program must be shown to meet a "compelling governmental interest," and must be "narrowly tailored to meet that interest" (4);
- *Hopwood v. State of Texas*, in which the court rejected the notion that achieving racial diversity in a student body can ever be a sufficiently compelling reason for racial discrimination. Confining the remedial use of racial preferences to very narrow circumstances, the court reasoned that no state college or university may maintain race-based affirmative action programs (5); and
- the debate in the public higher education arena about eliminating remedial mathematics and English courses at the undergraduate level. Many educators argue that the elimination of these courses will have an adverse effect on minority students' matriculation into the higher education system. Elimination of these remedial courses will also necessitate increased articulation between community colleges and colleges and universities that grant bachelor's degrees. In 1991-92, 88.6% of four-year public and private institutions provided remedial instruction and tutoring; 91% of public and private two-year colleges offered these services (6).

### **The Congressional Role**

Congress is closely examining the effect of affirmative action on the workforce and is in the process of determining the need for repealing or revising affirmative action efforts. In fact, former Senate Majority Leader Robert Dole (R-Kan.) commissioned a study in February, 1995, by the Congressional Research Service of the Library of Congress. This study identified about 165 statutes, or regulations, or executive orders that include race, ethnicity, or gender as factors in federal employment or allocation of federal contracts or grants to individuals or institutions. (For full details, please refer to Appendix II.) Congressional action related to affirmative action prompted President

Clinton to instruct federal agency heads to eliminate or reform any programs that

- create a quota
- create preferences for unqualified individuals
- create reverse discrimination
- continue even after their purposes have been achieved.

As noted in *HR (Human Resources) NEWS (7)*, the Constitution Subcommittee of the House Judiciary Committee held a hearing on federal affirmative action programs. Both H.R. 2128, the Equal Opportunity Act of 1995, introduced by Rep. Canady (R-Fla.), and S. 1085, proposed by former Sen. Dole (R-Kan.) and counterpart to H.R. 2128, "would prohibit discrimination and preferential treatment on the basis of race, color, national origin, or sex with respect to all federal employment, contracts, and programs." S. 1085 cleared a House Judiciary subcommittee. The Senate Judiciary and Senate Labor and Human Resources committees also held hearings. The bill will have to clear two other committees (including Small Business) before coming to the floor. As of this printing, nothing further has been scheduled.

### **The Need for Program Review**

While educators and policy makers are concerned about the challenges to existing programs, it is clear that these programs could benefit from review and scrutiny, either affirming their inherent value and current structure or suggesting areas for modification and strengthening. A range of issues and considerations come to mind. For example, a recent paper by Stephen G. Brush entitled *Women, Science, and Universities (8)* noted a disparity between rhetoric and data. It has a simple premise: if women *are* given preferences, then why do they experience lower salaries and higher unemployment rates?

What about quotas? Are they really being used? Although quotas have always been illegal, except where court imposed as a remedy for past discrimination, they have sparked resentment as well as concern. However, as pointed out in the paper prepared by the Commission on Professionals in Science & Technology (CPST), with or without quotas, gains for minorities in SME areas have been small. (See Appendix III.)

- African Americans make up over 12% of the U.S. population and approximately 15% of the school-age population. Yet, they (U.S. citizens only) represent only 2% to 3% of Ph.D.s in SME and only 6% of SME bachelor's degree recipients.
- Hispanics represent almost 10% of the U.S. population and 12% of the school-age population. They (U.S. citizens only) receive only 3% of the Ph.D.s in SME and 4% of SME bachelor's degrees.

### **The Role of Educational Institutions**

Hence, what should educational institutions do? In reflecting upon the *Adarand* court case and the current affirmative action debate, education and policy leaders can offer several strategies.

- They can ignore *Adarand*. They can assume that those educational institutions that serve minority populations will devise their own strategies with no adverse effect on those populations or that the decision to ignore this court case will be unenforceable. However, ignoring the case is not a feasible option. We must address how a change in federal legislation could affect what institutions can or will do. If funding comes to a halt, what will happen? Will targeted programs survive on their own initiative?
- They can give priority to making structural changes in institutions, changes that support coordinated policies and practices to encourage the participation of underrepresented groups.
- They can provide true mentors to students. These mentors will encourage and guide students through the initial stages of their academic career and provide them with information and opportunities to help them pursue additional goals, whether these goals include obtaining advanced degrees or working in industry.
- They can recognize the key to maximizing the human potential of a diverse population: Each person must be placed in an environment in which he or she can best flourish and achieve to his or her full ability.
- They can generate incentives for diversity with an emphasis on educational excellence.

Reginald Wilson of ACE concludes his paper with the following recommendations.

- “Equally strong voices are needed in academia speaking in support of the principle of affirmative action, providing “teachable moments” to educate students and faculty as to why it is needed and why it is enriching to everyone, and criticizing those elements of the program that have not worked well.”
- “Leaders also need to critique carefully those policies that have been advanced as alternatives to affirmative action but that will not work: *Race neutral or color blind*. A policy that sounds good in the abstract but never works in reality because (1) progress or failure cannot be measured; and (2) it degenerates into the practice of business as usual, favoring mostly white males. *Policies based on need rather than race*. As Representative Gephardt states, “The United States has never had a history of discrimination against people who are in poverty that is at all comparable to barriers facing women and minorities.” “Though they sound attractive, policies based on need would fundamentally shift the purpose of the program away from compensation for prior discrimination. Moreover, the federal government currently has programs that address need and that should be expanded: Head Start, Upward Bound, Talent Search, Pell Grants, etc.”
- “Lastly, the defenders of affirmative action should be the first to criticize those programs that do not work: set-asides that are abused, quotas that are introduced illegally, hiring unqualified minorities to fill token slots, etc. Only if we criticize our mistakes will we retain our credibility. In the present climate of the political assault on affirmative action, it is all the more important to speak out with a strong voice to defend what is right and what is working as well.”

Educational institutions should consider the following:

- **strict scrutiny**  
*Strict scrutiny* is an analysis the Supreme Court requires for constitutionality. In brief, under strict scrutiny, a racial or ethnic classification must serve a

“compelling interest” and must be “narrowly tailored” to serve that interest. There are no definitions, per se, of strict scrutiny. Rather, it is subject to interpretation in each court case. With the exception of the 5th district (Louisiana, Mississippi, and Texas), the 1978 Supreme Court decision in *Regents of the University of California v. Bakke* is the ruling case endorsing racial diversity. It allows for affirmative action based on the goal of racial diversity.

- **the language of affirmative action**

While the current SME programs continue to operate as model programs — targeted by race, ethnicity, or gender — emerging federal and state statutes, regulations, and executive orders focus on “children in poverty” or “inclusiveness” or “all.” In terms of legislative language, this shift is from the individual to the institutional, the preferred to the encouraged, the model programs to the systemic programs, and the entitled to the enabled.

- **the lessons learned from research on SME programs**

Many existing strategies to increase the participation of minorities and women in SME were developed without the base of research that we have begun to amass. Research should inform program design and practice. In studying the evolution of educational-based affirmative action programs, it has taken over 30 years to move from remedial-based education to standards and systemic reform that can affect the infrastructure of educational institutions. (Table 1 presents the evolution of SME Programs. Table 2 presents components of the National Science Foundation K–12 systemic reform initiative.)

- **a structural reform in higher education**

In looking specifically at affirmative action programs in higher education, the AAAS’ study, *Investing in Human Potential (IHP): Science and Engineering at the Crossroads (13)*, focused on efforts by U.S. higher education institutions to increase the participation of women, people with disabilities, and non-Asian minorities in science, mathematics, and technology (SMT). The IHP study, funded by NSF, included survey responses from 276 presidents or chancellors of colleges and universities, directors

of nearly 400 recruitment and retention programs, nearly 100 disabled student services offices, and intensive case studies of 13 colleges and universities. In general, IHP identified model SMT undergraduate programs and courses as well as academic and administrative challenges that needed to be addressed in order to bring about change in undergraduate SMT education. (See Figure 2 on page 8.)

Not found among any of the institutions in the IHP study was a model of *structural reform*, that is, where the structure of courses, pedagogical techniques, institutional climate, and system for recruitment and retention coexisted with a supportive administrative structure. The departments and programs did not provide mechanisms to support the achievement of all students who were committed to education in science and engineering. Although affirmative action efforts have provided minority and women students with access to higher education, they have focused primarily on diversifying the student population with little attention paid to smoothing the path for them.

Given that we have identified some of the institutional barriers for these students, perhaps the time has come to refocus the goals of affirmative action programs. We need to reach a balance between diversifying students and restructuring higher education if these institutions are to meet the needs of a diverse student population. If we do so, we will get closer to achieving both access and equal treatment of students in higher education settings.

- **the market forces that affect the participation of minorities and women in the SME workforce**

These forces include the graduate admission process, the downsizing of colleges and universities, the shifting of jobs for SME doctorates from universities to business, the broadening of job skills to include business skills, reduced research funds, and a global SME market. (See Table 3 on page 10.)

- **evaluation**

In many cases we have been reluctant to openly critique, challenge, and evaluate affirmative action

efforts for fear that no other programs would be substituted, that colleagues would feel threatened, or that the community would not support it. The changing policy climate, however, has made it possible and imperative that such review by affected, supporting, and involved communities be undertaken. A strategic, ongoing review to assess the effectiveness, the adherence to best practices, and the long-term effect on the educational system — as well as its ability to withstand proposed legislative changes — is long past due.

• **how minorities and women move through the SME education system**

Rather than the pipeline model that is frequently used to illustrate how minorities and females move through the SME education system, Dr. Clifton Poodry and his colleagues at the National Institutes of Health have proposed a metabolic pathway model for looking at how students move into medical and biomedical careers. (See next section on Improving Biodiversity.)

**TABLE I.**

**THE EVOLUTION OF SCIENCE, MATHEMATICS, AND ENGINEERING AFFIRMATIVE ACTION PROGRAMS: MAJOR EVENTS AND EFFORTS**

**Affirmative action programs evolved from the best hypotheses of what programs would work during a particular time, with mid-course corrections enacted as we gained new insights and knowledge. The evolution of SME affirmative action programs have their roots in education programs that started in 1965, and today is most visible in the National Science Foundation's systemic reform efforts. Major events and efforts of SME affirmative action programs include the following:**

■ The passage of the *Elementary Secondary Education Act (ESEA)* that established remedial programs for poor and disadvantaged children in the K–12 system, including Title I (Chapter I). Later legislation led to the creation of bilingual education, special education, and programs for girls. Since minorities are more likely to be poor and disadvantaged, they are disproportionately represented in these remedial programs.

■ The *Improving America's Schools Act* of 1994 (the reauthorization of the *Elementary Secondary Education Act (ESEA)* of 1965), which shifts education categorical programs from a focus on remedial mathematics education to higher level standards-based mathematics.

■ The creation of *Upward Bound* in 1965 and, subsequently, other remedial college and university-based programs that were designed to prepare poor and disadvantaged high school students for college.

■ The creation of *Pell Grants* (1965) and *Stafford Loans* for college tuition, as well as increased state,

foundation, and corporate support for minority scholarships. In retrospect, policy makers and educators assumed that money was the primary barrier and that if financial support for college was provided to minority and female students, we would see an increased number of minorities and women graduating from colleges and universities.

■ The creation of college learning centers in the 1970s to deal with the high college and university attrition rates of minority students. During the 1970s, educators recognized the need to provide both academic and psychological support for minority students, so these students could successfully compete and survive in the college and university environment. However, academics in learning centers consisted of remedial English and mathematics courses, rather than supplemental activities or tutoring in calculus, chemistry, and physics. In addition, these learning centers were usually not connected to academic departments.

■ The development of the *Minorities in Engineering: A Blueprint for Engineering Education* (known also as

TABLE I. (CONTINUED)

the Sloan Blueprint) in 1974. The subsequent establishment of the National Action Council for Minorities in Engineering, Inc. (NACME) in 1974 led to the development of recruitment and retention programs in schools and colleges of engineering. During this period, some precollege programs shifted away from being remedial programs toward enrichment programs that included high school-accelerated courses in pre-calculus, chemistry, and physics. Later, minority and college retention efforts that focused on the more difficult courses (calculus, chemistry, and physics) were established within schools and colleges of engineering.

However, fewer NACME-like programs exist for girls and women. Women in Engineering Programs Advocates Network (WEPAN) was founded in 1990 to support those engaged in activities to increase women's participation in engineering programs. Perhaps the single most effective program for getting more women into the SME workforce in a short amount of time was the National Science Foundation reentry program for women. This program identified women who had bachelor's degrees in SME fields and who wanted to pursue post-baccalaureate programs, get masters' degrees, or retool their advanced degrees to enter or reenter the SME workforce.

- The formation of an Association of American Medical Colleges (AAMC) taskforce in 1968 to increase the number of minority medical professionals. The development of *Project 3000 by 2000* (1990) to enroll 3,000 minority students a year in U.S. medical schools by the year 2000.

Project 3000 by 2000 has made great progress in harnessing the scientific resources of academic medical centers to work in partnership with local school systems with large minority populations to improve the quality of education, especially in the sciences. AAMC's new initiative, Health Professions Partnership Initiative (HPPI), provides funding to support these partnerships.

Both *Project 3000 by 2000* and *HPPI* are educational reform programs designed to increase the pool of minority applicants for all science-intensive fields, with the goal of increasing the pool of academically well-prepared minority students.

- The development of programs to encourage minorities to enroll in SME graduate programs, including the *Minority Biomedical Research Support (MBRS) Program* (1972), the *Minority Access to Research Careers (MARC) Program*, *Graduate Engineering Degrees for Minorities Program (GEM)*, *Graduate Opportunity Programs*, and *Patricia Roberts Harris Graduate Fellows Programs*. (The MBRS and MARC programs were supported by NIH; minority graduate Fellows programs by NSF, the Ford Foundation, and others, and they were managed by the National Research Council.)

- Efforts to strengthen Historically Black Colleges and Universities and Minority Institutions (HBCU/MIs), including *Minority Institutions Science Improvement Program (MISIP)* (1972), the *White House Initiative on Historically Black Colleges and Universities* (1979), the *NSF Resource Centers for Science and Engineering* (1977) and the *Comprehensive Regional Centers for Minorities*, and other federal and industry-based consortia and collaborations with HBCU/MIs.

- The development of the Mathematical Sciences Education Board, the mathematics standards initiative, and the subsequent publication of *Everybody Counts*, which were followed by the calculus reform led by the Mathematical Sciences Education Board (9), the Mathematics Association of America, and the National Council of Teachers of Mathematics (1980s). These reforms established mathematics as an inclusive rather than exclusionary field.

- The national standards movement and other standards-related efforts such as the AAAS *Project 2061* (advancing the notion of science for all) and the *National Science Teachers Association (NSTA) Scope, Sequence and Coordination Project* in the late 1980s.

- The College Board initiative *Project EQuality*, a pre-standards movement effort to define curriculum goals so as to promote quality and equality, and *Equity 2000*, efforts to support the taking of advanced mathematics courses by minority students to ensure their full course and career access.

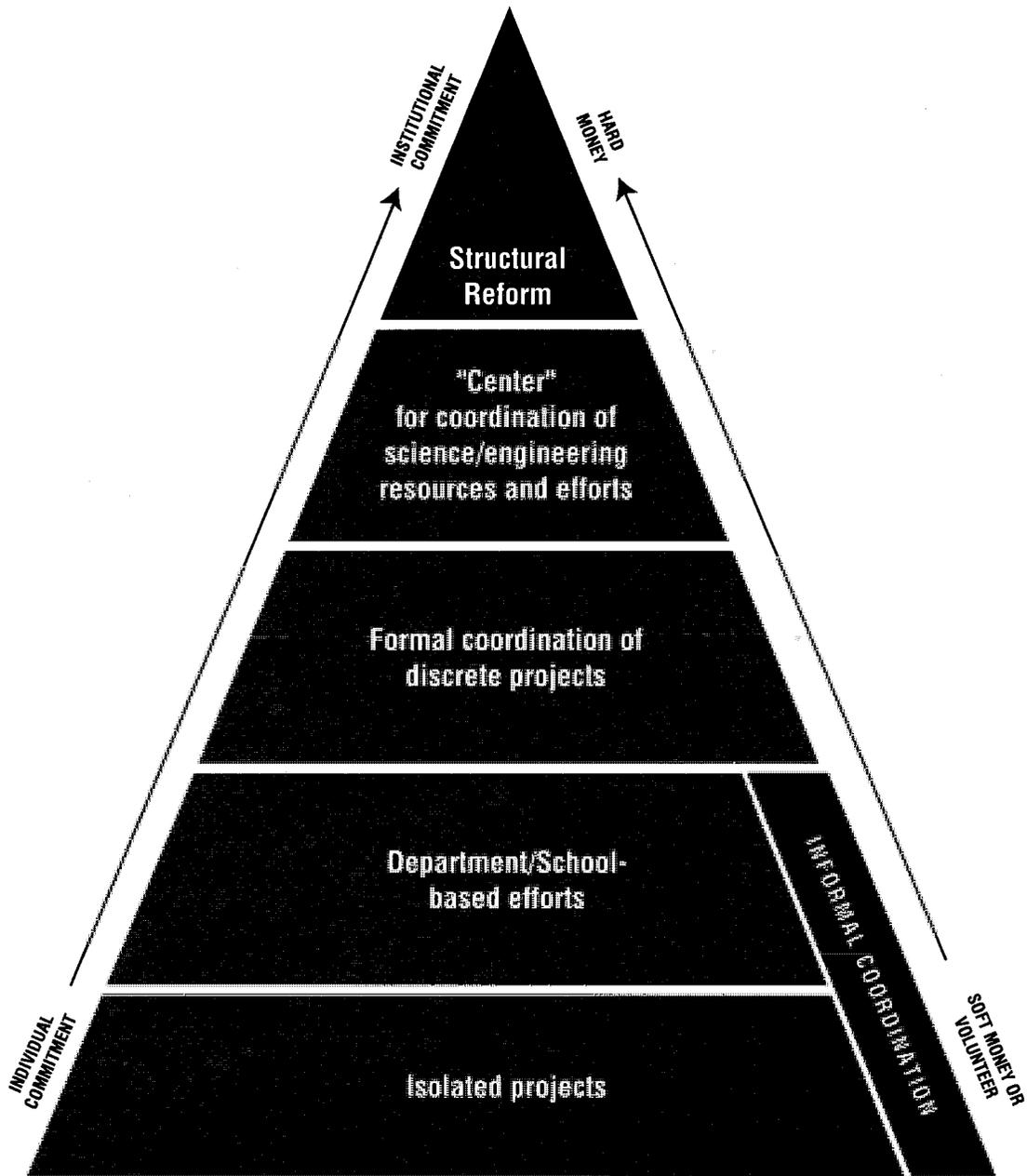
**TABLE 1. (CONTINUED)**

<ul style="list-style-type: none"> <li>■ The K-12 systemic reform movement at the NSF, including state systemic reform (1991), the urban systemic initiative (1994), and the rural systemic initiative (1995).</li> </ul>	<p>(10) and <i>A Strategic Planning Document for Meeting the 21st Century</i> (11).</p>
<ul style="list-style-type: none"> <li>■ <i>Goals 2000</i> efforts to support states in their K-12 standards-based reform activities (1994).</li> </ul>	<ul style="list-style-type: none"> <li>■ <i>American Association for Higher Education (AAHE)</i> efforts through the Education Trust K-16 initiative to connect higher education to systemic reform efforts (1994).</li> </ul>
<ul style="list-style-type: none"> <li>■ Introduction of the federal interagency plans for achieving excellence in SME education at all levels, including <i>Investing in Our Future: Science, Mathematics, Engineering, and Technology Education</i></li> </ul>	<ul style="list-style-type: none"> <li>■ Appointment of the NSF committee to conduct a review of the state of SME undergraduate education programs and to recommend both needs and opportunities for improvement (1995).</li> </ul>

**TABLE 2.**

**THE NATIONAL SCIENCE FOUNDATION SYSTEMIC REFORM EFFORT: REQUIRED ACTIVITIES**

<p><b>The National Science Foundation's systemic reform efforts bring governors, chief state school officers, state legislators, local superintendents, mayors, and other policy makers, business leaders, and parents into decision-making roles. The tasks listed in this table are necessary elements in the implementation of NSF's program.</b></p>	
<p>1. The implementation of comprehensive, standards-based science, mathematics, and technology (SMT) education for all students, including alignment of curriculum, instruction, and assessment and provisions for long-term in-service and preservice teacher development.</p>	<p>4. The building of broad-based support for SMT education among parents, policy makers, higher education institutions, business and industry, and foundations. Through its <i>Informal Science Education</i> and the <i>Women and Girls in Science</i> programs, NSF has supported community- and family-based programs offered by science museums and youth-serving organizations such as Girls Incorporated, Educational Development Centers, ASPIRA, Girl Scouts USA, and the National Urban League.</p>
<p>2. The development of coherent and consistent policies that support high-quality SMT education for all, including policies related to SMT courses needed for high school graduation, admission to higher education, and teacher licensing.</p>	<p>5. The collection of evidence that demonstrates improvement of student achievement (particularly for minorities, women, and students with disabilities) in SMT, including higher test scores, increased numbers of students in higher level SMT courses, increased college admission rates, and portfolio assessment that provides actual examples of student work.</p>
<p>3. The convergence of all resources that could be used for SMT education, including funds from the <i>Improving America's Schools Act</i> that provide support for schools that serve high numbers of children in poverty, special education, bilingual programs, and programs for girls.</p>	



**Fig. 2. SME Affirmative Action Programs in Higher Education**  
*(Investing in Human Potential: Science and Engineering at the Crossroads, 1991)*

**EXPLANATION FOR FIGURE 2:  
SME Affirmative Action Programs  
in the Higher Education System**

In looking specifically at affirmative action programs in higher education, the AAAS' report, *Investing in Human Potential (IHP): Science and Engineering at the Crossroads* (1991), funded by NSF, focused on efforts by U.S. higher education institutions to increase the participation of women, non-Asian minorities, and people with physical disabilities in science, mathematics, and technology (SMT). The IHP study included survey responses from 276 presidents/ chancellors of colleges and universities, directors of nearly 400 recruitment/retention programs, nearly 100 disabled student services offices, and intensive case studies of 13 colleges and universities. In general IHP identified:

- model SMT undergraduate programs and courses;
- and academic and administrative challenges needing to be addressed in order to bring about change in undergraduate SMT education.

Based on project descriptions and case studies collected as part of the IHP study, a model for the evolution of recruitment and retention programs for minorities, females and students with disabilities at colleges and universities was developed. This model includes five (5) levels of programs as summarized below.

1. Isolated projects were numerous and involved the commitment of individuals to address particular barriers to participation. These projects were often not connected to any other efforts and relied on soft money or volunteer activity for their continuation.
2. In other instances, *individual schools or departments* undertook activities to address their own particular problems, such as high failure rates in calculus. These activities had little or no connection to other efforts in the institution, and addressed only a small part of the overall system of problems which minorities, women, and students with disabilities face.
3. At the next level were *formalized, coordinated program activities* in one part of the institution, such as a college of engineering, where recruitment and retention of female and minority students were coordinated through the office of the dean. Funding for these programs included external

grants, but relied increasingly on hard dollars from the institution. Most frequently missing from these programs were ties necessary to modify required introductory courses in the sciences and mathematics. There was often reliance on programs to equip the students to survive instead of also addressing the issue of the quality and cultivation aspects of courses.

4. In a few instances, institutions created *centers* for the coordination of large parts of the process of recruiting, retaining, tracking, and advancing students to graduate education. *One of the most notable examples of this is the Comprehensive Regional Center for Minorities in Puerto Rico.* In this case, the center formed an organizational overlay to the mission of the institution to educate particular groups of underrepresented students.
5. Not found among any of the institutions was a model of *structural reform* where the structure of courses, pedagogical techniques, institutional climate, and system for recruitment and retention co-existed with a supportive administrative structure, that is, where the regular support of departments and programs provides mechanisms to support the achievement of all students committed to education in science and engineering.

TABLE 3.

**THE PARTICIPATION OF MINORITIES AND WOMEN IN SCIENCE, MATHEMATICS, AND ENGINEERING WORKFORCE: THE EFFECT OF MARKET FORCES**

1. Admissions to graduate school departments are more personalized than admissions for undergraduate studies. Minority and women students must first be admitted to the schools and then identify a mentor or advisor who will guide their graduate studies.

2. Many research universities have downsized, reducing the number of majors and substituting part-time, adjunct professors for regular, full-time professors.

3. Work sites for many SME fields have shifted from the academic sector to the business sector, particularly in the biomedical area.

4. New SME graduates are facing very different work markets today than earlier SME graduates faced. The number of scientists currently seeking research grants and research jobs has outstripped the amount of funds available to these scientists. Traditionally, students were encouraged to pursue research. However, new work markets require them to "broaden" their training beyond their ability to conduct research.

Universities are struggling to redefine their Ph.D. programs to accommodate the changing job market, including forging interdisciplinary programs and revenue-generating ties with industry and government (12). Although an increasing number of new SME Ph.D.s are taking jobs in industry, not all colleges and universities are providing them with the social and business skills needed for corporate life, particularly in terms of corporate values, attitudes, expectations, and work styles.

5. New principal investigators (PIs), particularly minority and women PIs, face an uphill battle in obtaining research grant funds. Programs such as the National Science Foundation's *Faculty Early Career Development Program* (also known as CAREERS) and the National Institutes of Health's *Minority Access to Research Careers* have provided avenues for new PIs to obtain start-up research funds. The new

PIs are expected to move from these "new start" opportunities into a research grant arena where competition is stiff even for the most senior researchers. As federal funds become tighter, challenges are likely to be mounted against "start-up" research grant programs for minority researchers. No human resources development policy or strategy exists that guides federal agencies in the distribution of research funds among new and established investigators.

6. Foreign nationals affect both the SME education pipeline and workforce. In 1992 foreign students represented one-third of all U.S. SME graduate students. In addition, immigration changes have led to increased numbers of foreign scientists and physicians in the U.S. workforce (12). The impact of foreign nationals is greater in some fields than in others. Their presence has been suggested as a reason that some institutions have been able to ignore the challenge of increasing the number of U.S. minority participants in graduate SME education.

7. The new market is a global one. While we may argue as to how foreign nationals affect the SME workforce, U.S. scientists need to be prepared to compete in a global market. As Karl Pister, co-chair of the Expert Panel on *The Federal Investment in Science, Mathematics, Engineering, and Technology Education: What Now? Where Next?* (1993) (14) states: "We are involved in two wars in this country: a civil war between the underclass and the privileged in our major urban centers and a global war to compete for economic survival. The key to resolving both conflicts is education." In *A View From the National Science Board: Toward the Next Century: The State of U.S. Science and Engineering* (1994) (15), one of the major recommendations is that federal agencies providing SME support must systematically pursue international cooperation in the research area. But one has to wonder if the international focus distracts us from domestic problems?

## **Improving Diversity in the Biomedical Research Workforce**

A number of exceedingly important problems require new thinking. Underrepresentation in the sciences is one of those problems. The tremendous underrepresentation of certain segments of our population in health care or in careers in biomedical research costs all of us in many ways. There is a cost to the country to have a significant part of the population underserved in health care and underserved in education. Society pays in the long run. As the ad for oil filters says “you can pay me now or you can pay me later.” A couple of examples for consideration are:

- the cost of more expensive health care than preventative care
- the cost of unemployment that might extend beyond the underserved themselves
- the costs due to the stress and societal degradation of having a permanent underclass or class of “have nots.”

We must find ways to bring diversity to the education and research enterprise. We need more minds committed to finding viable, cost effective solutions.

The commonly used metaphor for the flow of talent from the large pool of young students interested in science to the ultimate, small numbers who actually become scientists has been a pipeline model. Two very important lessons emerge from viewing the flow as along a pipeline. First, you must start with a large input because there are many constrictions or leaks along the way. Since we know that the numbers at the end of the line are related to the numbers entering, there must be an adequate representation at the beginning of the pipeline. Second, you must control the leaks and retain interest to reduce the numbers that leave the pipeline.

Over the past year we in the Minority Opportunities in Research Division of the National Institute for General Medical Science, which includes Dr. Adolfus Toliver of the MARC Program, Dr. Ciriaco Gonzales of the MBRP Program, and in particular Dr. Pamela Marino who works with both programs, have been using a different model based on the metabolic pathway. (See Figure 3 on page 12.)

The intermediate products of one step along the academic pathway are the substrates for the next step,

much like the intermediate products in a metabolic pathway. We see that it is more than a linear process than is implied in a pipeline analogy. We can also see that there are more than intermediates; some products are removed from the main pathway and there are competing reactions for the same substrate. Depending on the rate constants and other factors such as catalysts, one branch of the pathway may be more efficient or more utilized than another.

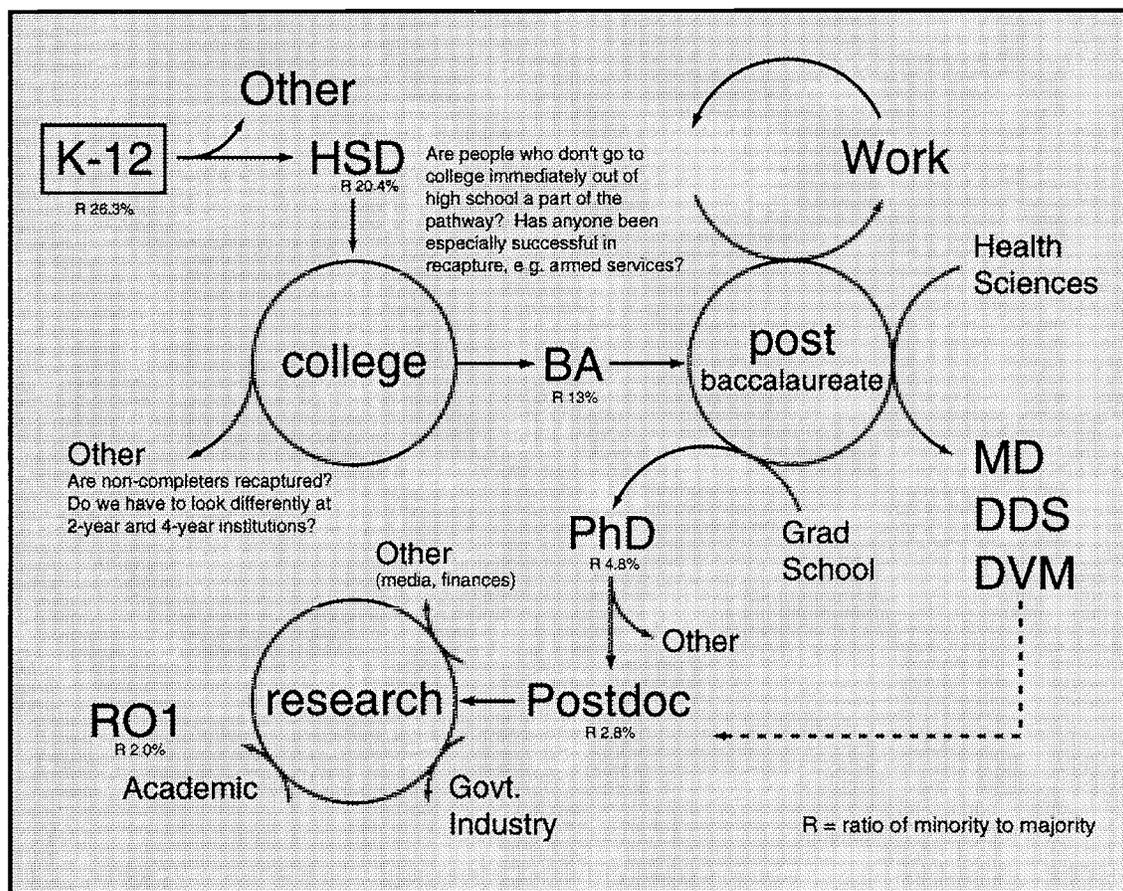
Further, we can visualize several distinct transition points in the pathway that may be targets for intervention or renewed emphasis. One that is particularly evident is in the completion of the Ph.D. where minorities are less than half as likely as Caucasians to graduate with a Ph.D.

It is apparent that large numbers of individuals, probably for well considered personal reasons, embark on pathways that are alternatives to Ph.D.s and research careers. We can imagine the utility of new catalysts to promote reentry into the pathway of some of those individuals. For example, some who have chosen to enter the workforce after obtaining a baccalaureate might be encouraged to take further steps toward a Ph.D. Another group divergent from the main path could be encouraged to consider research careers is the cohort receiving clinical doctorates.

We believe that the solutions to the problems of underrepresentation of minorities in science must come from a broad participation of many interested parties. We encourage new partners such as industry, the scientific societies and non-minority institutions to join in the effort. Perhaps examining the issue from the perspective of the pathway model will suggest new opportunities for your participation.

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*Clifton Poody, Ph.D., NIH*



**Fig. 3. The Metabolic Pathway Model for Student Development in Biomedical Research**  
(Gonzales, Marino, Poodry, Toliver; Minority Opportunities in Research Division, NIH)

### SME Education Efforts

In 1993, the Committee on Education and Human Resources (CEHR) of the Federal Coordinating Council for Science, Engineering and Technology (FCCSET) appointed an expert panel to review and assess SME education efforts. Based on the findings that federal government-based SME programs needed greater coordination and that more extensive evaluation should be conducted, NSF, NIH, and other federal agencies are intensifying their evaluation efforts. (Over the years, NSF and other foundations have supported smaller studies that reviewed and recommended changes and new directions for SME education programs. One such study was the AAAS report, *Equity*

and *Excellence: Compatible Goals* (16), which identified a number of distinctive characteristics of exemplary SME programs. (See Table 4 on page 13.)

Although this list of distinctive characteristics exists, the best programs are those that accomplish what they are designed to accomplish. How do we measure the effect of specific programs? How can we tell whether the intended effects are being realized, and how do we maximize program investment? These challenges are being encountered in the review of all federal research and education programs.

**TABLE 4.**

**EXEMPLARY SCIENCE, MATHEMATICS, AND ENGINEERING PROGRAMS:  
DISTINCTIVE CHARACTERISTICS**

1. A strong academic component in mathematics, science, and communications, focused on enrichment rather than remediation.	9. Cooperative activities with a university, industry, or school.
2. Academic subjects taught by instructors who are highly competent in the subject matter and believe that students can learn the materials.	10. Opportunities for in-school and out-of-school learning experiences.
3. Heavy emphasis on the applications of science and mathematics and on careers in these fields.	11. Parental involvement and the development of a base of community support.
4. An integrative approach to teaching that incorporates all subject areas, hands-on opportunities, and computers.	12. Specific attention to removing educational inequities related to gender and race.
5. Multi-year involvement with students.	13. Involvement of professionals and staff who resemble the target population.
6. A strong academic director and a committed staff who have a low turnover rate and who share the program's goals.	14. Development of peer support systems including the involvement of a "critical mass" of female or minority students or both.
7. A stable, long-term funding base with multiple funding sources so that staff do not spend large portions of their time searching for financial support.	15. Evaluation, long-term follow-up, and careful data collection.
8. Recruitment of participants from all relevant target populations.	16. "Mainstreaming," the integration of program elements that are supportive of women and minorities into institutional programs.

*(Equity and Excellence: Compatible Goals (1984))*

**Conclusion**

Under the assumption that what we measure (in terms of output) is what we get, a failure to include education and human resources development as criteria measured to determine the success of institutions and individual faculty and then to respond, reward, and reinforce based on these criteria will likely produce negative effects as we attempt to reform agencies and institutions. For example, the science community has articulated the value of integrating research and

education in strengthening the U.S. research enterprise. However, if publication in refereed journals is the only criterion by which institutions measure faculty success, then increasing a professors' responsibilities to include attracting and nurturing a diverse student population is not likely to yield positive results. Behaviors that are measured, recognized, and rewarded are likely to be behaviors that we see.



## CHAPTER 2.

### *General Recommendations from the Forum*

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Recommendations were made for consideration by federal and state governments, government agencies, and colleges and universities. These recommendations were made with the understanding that SME programs for minorities and women may have one or more of these goals:

- increasing the number of minorities and women who begin science and engineering careers.
  - increasing science literacy for all Americans.
- Regardless of career choices, all Americans must be prepared to deal with an increase of science and technology in their lives and workplaces. In this technology-rich society, policy makers and citizens are increasingly called upon to make personal and voting decisions related to science, including issues related to health care, environmental risk, and access to telecommunications (17). Current research suggests that the science literacy gap is larger for African American and Hispanic American populations than for White populations (18).

#### **Recommendations to Federal and State Governments**

1. The most important recommendation from this meeting was that federal and state governments should continue to support quality targeted SME education and career programs for minorities and women while also incorporating equity concerns into systemic and institutional reform efforts (with the ultimate goal of having excellent and equitable programs that make targeting unnecessary).
2. Federal support for minority undergraduate research programs (URP) should continue. URPs exist in the form of NSF Research Center Programs and the NIH Minority Access to Research Careers (MARC) and Minority Biomedical Research Support (MBRS) programs, as well as other federal efforts by the U.S. Department of Energy (DOE)

and the National Aeronautics and Space Administration (NASA).

#### **Recommendations to Government Agencies**

1. NSF should place a stronger emphasis on Criterion (4) — found in NSF’s *Grant Proposal Guide (19)* — in the evaluation and selection of research and education projects. Criterion (4) includes questions related to the effect on the infrastructure of science, including education and participation of women and minorities in science and engineering. Other federal agencies should adopt and include similar criteria.
2. Government agencies should develop mechanisms to identify and reward individuals, faculty, and departments that place greater emphasis on innovative teaching strategies, mentoring, and developing programs and partnerships that foster equity and diversity in SME.

#### **Recommendations to Colleges and Universities**

1. HBCUs/MIs and women’s colleges should continue to build and strengthen consortia and collaborations with other colleges and universities, national laboratories, and business and industry. These include developing dual degree and cross-registration programs, consolidating science and engineering resources into centers, reforming undergraduate curriculum, creating research opportunities, and forging revenue-generating links between industry and government similar to the Experimental Program to Stimulate Competitive Research (EPSCoR) Model.

EPSCoR fosters systemic and sustainable changes through universities to support competitive academic research and high-quality SME education. EPSCoR assists less competitive states that:

- a) historically, have received relatively little federal

R&D funding; b) have demonstrated a commitment to develop their research bases; and c) have worked to improve the quality of science, mathematics, and engineering research conducted at their universities and colleges. This model of developing coherent, appropriate research and education partnerships has merit as a model beyond the states for which it has been targeted.

2. Colleges and universities and SME departments should pay more attention to retention and graduation rates at both the undergraduate and graduate levels, particularly as related to minorities and female students. Exit interviews should be conducted to determine why minorities and women leave SME programs, to identify retention strategies, and to incorporate these strategies into the operation of schools, colleges, and departments.
3. Attention should be paid to ensuring that minority and female undergraduate students with portable financial aid be given the opportunity to participate in undergraduate retention programs. At the graduate level, attention must be given to ensuring that minority and female students with portable fellowships are given equal treatment and the same opportunities — such as access to labs and equipment — as graduate students who are supported by faculty research funds. Oftentimes, graduate students with portable fellowships rotate from faculty member to faculty member within SME departments and experience difficulty in becoming a part of a research team and in finding a mentor.
4. To increase graduate school enrollment of minority and female students, colleges and universities should develop early admissions programs that admit students into graduate programs as early as the junior year of undergraduate school. One program that places minority students on a fast track to graduate school is the National Consortium for Graduate Degrees for Minorities in Engineering and Science, Inc. (GEM). Established in 1976, GEM identifies, recruits, and enrolls minority science and engineering students in graduate programs leading to an advanced degree.
5. Colleges and universities should develop programs that help strengthen both the teaching and

mentoring skills of SME faculty, particularly as related to minorities, women, and students with disabilities. SME faculty are usually trained to conduct research and are not required to take teaching courses in pedagogy as part of their degree completion. In addition, faculty are not generally trained in how to deal with issues related to diversity.

NACME has been conducting diversity workshops for faculty. GEM has developed the GEM National Institute on Mentoring (NIM). The Association for Women in Science (AWIS) has produced a number of publications related to mentoring women.

6. Schools and departments of science need to develop coordinated recruitment and retention efforts for minorities and women similar to those developed by colleges and schools of engineering.
7. Colleges and universities should develop curricular plans that strengthen preservice teacher education, including developing connections between SME departments and schools of education.
8. Colleges and universities, including staff and faculty who operate programs for minority and female SME students, should develop partnerships with NSF K–12 systemic reform initiatives. Such partnerships could include out-of-school SME programs or evaluation and research on the effectiveness of in-school SME programs.
9. Colleges and universities should develop partnerships with professional associations, community-based and youth-serving organizations, local churches, science museums, and other groups that operate K–12 SMT programs for children and their families.
10. Colleges and universities should develop mechanisms to identify and reward individuals, faculty, and departments that emphasize innovative teaching strategies, mentoring, and developing programs and partnerships that foster equity and diversity in SME.

## CHAPTER 3.

### *Future Needs and Directions of College- and University-based Affirmative Action Programs*

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A need exists to educate college and university staff and faculty about the reality of emerging affirmative action issues. A new social compact between science and society must be developed. Research should be conducted on a variety of issues.

1. Continue to monitor the course of action that federal, state, and private funders are taking with respect to funding college and university programs targeted specifically for minorities and women.
2. Examine the outcomes that go along with different types of student funding mechanisms (both federal and private). Examine the importance of commitment on the part of the institution towards the student and the importance of the student being connected to a support system.
3. Study the impact of faculty mentoring of minority and female undergraduate and graduate students. Faculty need to be trained in how to effectively mentor such students.
4. Examine the admissions and completion history of minorities in SME programs. It is not clear that similar experiences are provided or that similar expectations are held regarding minority students, e.g., assuming that they will forego graduate education because they need to earn an income. Data are needed from colleges and universities, including interviews of graduates, to determine elements that support and impede minority and female students' completion of SME programs.
5. Explore models for transition of undergraduate students to graduate programs. With respect to retention rates, it is necessary to look at the long-term effectiveness of joint admissions programs (e.g., North Carolina Central and UNC-Chapel Hill Program) in terms of students admitted to graduate school and doctoral programs at the same time. Does joint admission result in higher retention and completion rates for students? In addition, we need to examine programs that provide more access to the research experience for all undergraduates. Do these joint admissions have different effects on minority and non-minority, male and female students?
6. Examine in further detail how foreign nationals affect the U.S. SME undergraduate and graduate pipeline and workforce. Examine the effect of a global market on participation and retention of minorities and women in the SME workforce. The value of diversity, the need to remain globally competitive, and the advantages of utilizing foreign experiences and world views should all be examined. What would a fair market look like? How would it act? How do we maximize the use of talent so that we don't "waste" anyone, yet continue to operate in a fashion that is fair, just, and within the guidelines of current legislation?
7. Identify the effect on higher education of K–12 systemic reform activities, including changes in admissions requirements, standards-setting by colleges and universities, and partnerships with schools.
8. Examine policies that limit the size of the pool of minority students available to higher education. These policies include disproportionate tracking of minority students into low-level mathematics and science courses, disproportionate referrals of minorities to special education classes, and the undiagnosed and untreated physical and emotional disabilities of some minority students.
9. Examine differential access to educational technology and its effect on student career selection and education outcomes. It is not clear that students can quickly catch up upon entering colleges and universities — even in a technology-rich environment — if their access to technology and technology skills has been limited at the K–12 level.

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**APPENDICES**

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*Affirmative Action: Yesterday, Today, and  
Beyond.* Reginald Wilson

**APPENDIX I**

Senior Scholar  
American Council on Education

May 1995

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## I. Introduction

...(D)iscrimination because of race, creed, color or national origin is contrary to the Constitutional principles and policies of the United States....

President John F. Kennedy  
Executive Order 10925  
March 6, 1961

Affirmative action has had a long and contentious history dating back many years in the United States. It began haphazardly without a clear sense of its final scope or full intent and evolved into the present complex of laws and executive orders. However, the purpose always was clear: to overcome the history of America's past of slavery, peonage, racism, and, finally, legally sanctioned segregation, that barred blacks (and other minorities and women of all races) from full participation in the work force and in America's educational institutions. The segregation was systemic and nearly complete. Such exclusion, especially of blacks, contradicted the lofty statements of the Constitution and Declaration of Independence and was a blot on the conscience of many Americans. These barriers have been deeply embedded in the attitudes and institutional structures of American society since the founding of the nation. Although many attempts have been made to eradicate these barriers, their attempted removal has been met with equally fierce resistance. What follows is the history of such attempts, in brief, from the past to the present.

## II. History

Eight decades into the twentieth century and more than a dozen decades following the end of legalized slavery in the United States, the nation has not achieved equality of educational opportunity for all its citizens. Although there is significant evidence that progress has been made toward the realization of equal opportunity in education, much more has to be accomplished before educational parity is attained.

James E. Blackwell<sup>1</sup>  
Professor of Sociology (retired)  
University of Massachusetts Boston

It is important to begin this history with African Americans because from the time of the nation's founding their status as slaves was legally sanctioned by the Constitution and codified into the laws of the United States. As a result, the laws to redress segregation and discrimination have been aimed primarily at them and secondarily at others.

Although the Freedman's Bureau and jobs for the freed slaves were established in 1865 immediately after Emancipation, these were reduced considerably by 1875, following great resistance by white southerners and the removal from the South of federal troops that were protecting the freed slaves. This resistance, plus many cumulative regional restrictions, was finally codified into national law by the infamous Supreme Court decision in Plessy v. Ferguson (1896), which legally sanctioned segregation of the races.

Plessy was followed immediately by the passage of Jim Crow laws in the South that prevented blacks from voting and restricted other areas of black life. By 1890, blacks were strictly segregated in every facet of life from public transportation to schools, and would remain so for half a century.

Although significant restrictions were imposed on other ethnic groups and on white women, most of the references in this part of the paper will be confined to African Americans

because the strictures applied to them were so pervasive and confining, and all were sanctioned by law in the South and by custom in the North, thus providing the initial impetus of the civil rights movement and the struggle for affirmative action. [The next section will deal with the impact of affirmative action on other ethnic groups and on white women.]

Despite the restrictions on black education, some strides were made, but they were limited. For instance, from 1876 to 1929, only 51 blacks were awarded the doctorate from American universities. It was not until 1930 that black colleges were given a special "approved" designation by the Southern Association of Colleges and Schools, and they were granted full membership only in 1957.<sup>2</sup>

Black scholars, however brilliant, were restricted to teaching at the historically black colleges (HBCUs). Yet, some of them were famous: W.E.B. DuBois, Harvard Ph.D., organized the first international Pan-African conference in London; Rayford W. Logan, who graduated Phi Beta Kappa from Williams College and earned a Ph.D. from Harvard, was head of the history department at Howard University; Charles Drew earned his M.D. degree from McGill University, headed the American Red Cross Blood Bank, and eventually taught at Howard.<sup>3</sup> Only five black colleges had graduate schools, and by 1933 they had awarded 76 master's degrees. Most southern blacks who wanted graduate education beyond the master's were paid by their state to go North to secure their degrees at white universities.

The black schools not only suffered from restrictions on their scholastic offerings but were underfunded as well. For example, one white school in 1943 had laboratory equipment valued at \$2,500 while the school for blacks had no equipment, and the white male teachers were paid \$2,508 per year while the black teachers were paid \$1,850 (even though over 50 percent of the black teachers had higher degrees than the whites).<sup>4</sup> In Mississippi, another example, as late as 1950, black schools received \$32.55 in education funding per pupil, whereas white schools received \$122.93.<sup>5</sup>

In 1941, a survey of the predominantly white colleges and universities conducted by the Julius Rosenwald Fund found only two black faculty—both in non-teaching, laboratory positions—in all of these institutions. That year, Dr. Allison Davis, the eminent black sociologist, was appointed to a full-time faculty position at the University of Chicago, at the urging of, and with his salary partially subsidized by, the Rosenwald Fund.<sup>6</sup>

These few facts are cited to stress two things: 1) that black education was strictly segregated by race until about 40 years ago; and 2) that it was not only segregated but systematically limited in curriculum and underfunded as well, restricting access and opportunity in various fields.

African Americans were equally restricted and segregated in the economic sphere. Blacks were confined by and large to unskilled jobs requiring physical labor—picking cotton, working as domestics, etc. With the advent of the First World War, the boll weevil's decimation of the cotton industry, and the subsequent migration of millions of blacks to the North, African Americans for the first time got factory and industrial jobs, albeit still mostly unskilled. However, it is instructive to remember that by 1917, on the threshold of World War I, 89 percent of blacks still lived in the South and still were confined mainly to agricultural and domestic work.<sup>7</sup>

The dramatic rise in racism in the United States ironically presaged the nation's entry into "the War to end all Wars." In the first decade of this century, Thomas Dixon published The Clansman (1905), Charles Carroll published The Negro as Beast (1900), Robert W. Shufeldt wrote The Negro, a Menace to American Civilization (1907).<sup>8</sup> The Republican Party platform of 1912 called for citizens "to condemn and punish lynching." The Democratic platform was silent on this issue. Between 1901 and 1910, 754 blacks were lynched.<sup>9</sup>

Slavery was our original sin, just as race remains our unresolved dilemma.

Senator Bill Bradley (D-NJ)  
1994

The history described above continued until 1940, the eve of World War II. At that time, 79 percent of African Americans still resided in the South. Of those blacks in college, 85 percent attended the HBCUs, and only a little over 1 percent of blacks possessed a college degree. Life for African Americans was still very segregated, despite the nation being on the verge of "the War for Democracy."

In 1940, A. Philip Randolph, a prominent black labor leader, met with President Franklin D. Roosevelt along with other black leaders to protest discrimination in the burgeoning defense industry that was gearing up at the time. Randolph warned the president that if blacks continued to be refused jobs in these plants, he would organize a march on Washington of thousands of blacks in protest. The threat convinced Roosevelt to issue Executive Order 8802, which barred discrimination by race or national origin in industries with government contracts. This led in turn to the second massive migration of millions of blacks from the South, many of whom sought jobs in the defense industries, which were located mainly in the North.

Following the war, the Servicemen's Readjustment Act of 1944 (popularly called the "G.I. Bill of Rights") granted every veteran a free college education or job training as well as a loan to purchase a home. Over one million African Americans had served in the armed forces in World War II, and thousands of them eagerly went to college—most of them to the HBCUs in the South, but many to predominantly white universities in the North, which welcomed all veterans with their government vouchers. Many colleges waived or lowered entrance requirements, gave extra points on entrance examinations, and provided extra help for veterans who had been out of school for three to five years (the first affirmative action in college admissions!). And the veterans prospered. "There has not been a college class that accomplished as much academically before or since."<sup>10</sup> Subsequently, the armed forces were desegregated by President Truman in 1946.

These two measures of the 1940s—Executive Order 8802 and the G.I. Bill—provided the first significant opening of employment and education for blacks since Reconstruction. It was from this threshold that the momentum was generated that led to the civil rights movement and eventually to affirmative action.

This brief recapitulation of history is cited to stress three issues: 1) affirmative action grew out of a continuous history of racial oppression of a group, not of individuals; 2) that history not only oppressed blacks but restricted their opportunity for education and employment; and 3) that history was accompanied by a virulent racism that continues, albeit in diminished form, up to the present. (The continuing effects of discrimination to the present day will be documented later in this paper.)

I say unequivocally, that the job of integrating African Americans, who were isolated generation after generation by official action and unofficial practice, into the American mainstream isn't done by any stretch of the imagination.

Hugh B. Price  
President, National Urban League  
February 10, 1995

### **III. Other Minorities and White Women**

Bringing the unique experience of women, particularly white women, a group of unparalleled size, into the discussion of affirmative action, is itself an important contribution. Race and racism have obscured the extraordinary role that affirmative action has played in moving women from their customary low tiers in the workplace.

Eleanor Holmes Norton  
Delegate to Congress  
District of Columbia  
(Clayton & Crosby, 1992, p. ix)

As previously stated, this paper recognizes the racial oppression of other ethnic groups and the legal restrictions on white women. Those circumstances are described briefly in this section.

American Indians, of course, were the most oppressed. After all, they were the original occupants of this land. Over the course of American history, tribes were ravaged by disease, defeated in battle, and subjected to constant violations of the treaties into which they were forced. Many American Indians were restricted to reservations, sent to boarding schools where they were beaten if they spoke their native languages, and denied educational and occupational opportunities.<sup>11</sup>

In much of the United States, Hispanic women and men, particularly those of Mexican ancestry, for long periods were restricted mostly to jobs as manual laborers and provided few educational opportunities. Now, although some can trace their roots in this country back generations or centuries, Hispanics of Latino origin have become the target of renewed anti-immigrant sentiment, exemplified most particularly in California by the passage of Proposition 187. That draconian measure is designed not only to discourage new immigration, but to withhold many benefits from legal as well as illegal immigrants.<sup>12</sup> The impact of affirmative action on Hispanics—the nation's largest minority group except for African Americans (and soon to overtake them)—has been profound.

Asian men first were imported to work on the railroads in the West. Asian women followed and were employed in menial positions. Later, Asians were denounced for "taking white men's jobs," and the fear of the "Yellow Peril" led to restrictions on Asian immigration in the Exclusion Act of 1924, which was not lifted until 1945. Additionally, Japanese Americans were illegally confined to detention camps during World War II as a "national security measure" (though the U.S. Supreme Court upheld their relocation) and lost much of their property while they were incarcerated.

White women were not restricted because of their race, of course, but were denied many higher education and employment opportunities because of sex discrimination. For example, women of all races did not win the right to vote until 1920. Additionally, many of the more prestigious universities accepted only white males for many years. However, white women had their own female institutions such as Barnard and Radcliffe, and began to make inroads into the white male universities early in the century. Still, women, though a majority of the population (53 percent), are not proportionately represented in higher education or in most occupations. Also, they continue suffer pay inequity as well as discrimination in the workplace and underrepresentation in elective offices.

However, white women's status is quantitatively as well as qualitatively different from that of other underrepresented groups because of their race. Thus, in looking at factors such as education, employment, and income, it is important in most instances to disaggregate white women and women of color, lest minority women be obscured in the limbo between "minority"

and "women."<sup>13</sup> Such disaggregation in no way denigrates the injustices still suffered by white women but recognizes the fact that minority women often face different obstacles to advancement.

Table I  
Percentage of White Women and Other  
Underrepresented Groups in Selected Professions

<u>Occupation</u>	<u>White Women</u>	<u>Minority Men and Women</u>	
		<u>Blacks</u>	<u>Latinos</u>
Doctors	22	4	5
Lawyers	24	2	3
Scientists	31	3	1

Source: Department of Labor, 1994.

A May 1994 study by the National Rainbow Coalition of the National Broadcasting Corporation (NBC) showed these patterns of disparity in the company's racial and gender hiring practices in its New York headquarters division: "Out of 645 employees of the News Division, 354 were white males, 261 were white females (a total of 96%), 8 were black males, 7 black females, 7 Latino females, 1 Latino male, 3 Asian males, 3 Asian females, and 0 Native Americans."<sup>14</sup>

Affirmative action is good for America, good for business,  
and good for working people because it promotes values of  
inclusion, fairness, and merit. Affirmative action does not  
mean quotas or arbitrary preferential treatment.

Women United for Equality  
Press Release  
March 15, 1995

Table II  
Income Disparities of  
Underrepresented Groups  
(% of white men's salaries)

	<u>Black Men</u>	<u>Black Women</u>	<u>Latino Men</u>	<u>Latino Women</u>	<u>White Women</u>
1975	74	55	72	49	58
1985	70	57	68	52	63
1993	74	53	64	NA	70

Source: Department of Labor, 1994.

Hispanics and American Indians first were identified for specific melioration of their situation following the Supreme Court decision in Brown v. Board of Education in 1954, which desegregated public schools. These groups also were found to suffer from school segregation, particularly in those southern states where they represented a large segment of the population—Texas and Oklahoma. They, and all other minorities, later were covered by the Civil Rights Act of 1964. The Adams decision of 1973 also covered Hispanics in Texas higher education.

Asian Americans are, at present, not considered underrepresented in higher education or employment as a group. However, particular subgroups of Asian immigrants—Vietnamese, Hmong, Laotians—had a high incidence of illiteracy and poor job skills. Where these populations were concentrated, they benefited from affirmative action programs. Singly they were treated as other Asian Americans needing no protection.

Women first were covered under anti-discrimination laws by Executive Order 11375, issued by President Lyndon B. Johnson in 1967, which added "sex" to the categories of protected classes. That coverage was expanded in 1972 under Title IX of the Education Amendments of that year.

Subsequently, the Age Discrimination Act was passed in 1975. In 1968, the Architectural Barriers Act had been enacted, requiring employers to modify buildings to make them accessible to the handicapped. This was followed in 1973 by Section 504 of the Rehabilitation Act, requiring affirmative action in the employment of people with disabilities.

It is evident that what began in 1941 as a prohibition opposing employment discrimination against blacks in World War II defense plants has evolved into an increasingly complex and multi-layered set of laws and sanctions covering other minorities, women of all races, the elderly, and the handicapped. What began simply as a concern with fair hiring increased in complexity as knowledge and awareness of the problems of society grew. The laws and sanctions then proliferated to cover modification of buildings, recruitment of black and Hispanic students into predominantly white universities, more equitable funding for minority educational institutions and women's programs, and increased hiring of women and minority faculty and administrators. All of these directives fall under the heading of "affirmative action" although, strictly speaking, the term applies only to the Executive Orders.<sup>15</sup>

But what also is conspicuously evident is that these various laws and rules grew without a strong governmental or legal theory binding them coherently together. Therefore, some of the laws are conflicting and contradictory and exceedingly difficult to interpret, adding to the confusion and frustration of both those who oppose them and those who support them, and thus weakening their effectiveness and giving the courts unclear direction in interpreting them.

In the next section, we examine the various laws, acts, and court decisions regarding affirmative action.

#### IV. The Laws, Court Decisions, and Executive Orders

[T]here is now little dispute over the power of courts to order remedial affirmative action plans, or the right of parties to settle their case with consent decrees incorporating such plans.

Deval L. Patrick  
Assistant Attorney General for Civil Rights  
Testimony to Congress  
March 24, 1995

The following annotated cases are meant not to be exhaustive but to illustrate the legal history of affirmative action and how opinions change over time.

##### Executive Orders

- 1941 - Order 8802 (Roosevelt)  
No discrimination by race in defense plants.
- 1961 - Order 10925 (Kennedy)  
Encouraged affirmative action but had no enforcement procedures.
- 1965 - Order 11246 (Johnson)  
Ordered all government contractors to take affirmative action.

- 1967 – Order 11375 (Johnson)  
Added “sex” to protected classes of persons.
- 1978 – Revised Order No. 4 (Nixon)  
Detailed specific goals and timetables for effective plans.

### Laws

- 1964 – Civil Rights Act - Title VII  
Prohibited all forms of discrimination in public and private sector hiring. (Did not apply to higher education faculty until 1972.)
- 1968 – Architectural Barriers Act  
Ordered that buildings be modified to give access to the handicapped.
- 1972 – Educational Amendments – Title IX  
Prohibited sex discrimination in any “federally assisted education program.”
- 1973 – Rehabilitation Act – Section 504  
Required affirmative action in employment of the handicapped.
- 1975 – Age Discrimination Act  
Barred discrimination in hiring or firing of older persons.
- 1991 – Civil Rights Act  
Corrected some Supreme Court decisions (Wards Cove, Martin) that Congress felt had been decided wrongly.

### Federal Court Decisions

- 1954 – Brown v. Board of Education  
Ended segregation in the public elementary and secondary schools; *de jure* in the South, *de facto* in the North.
- 1971 – Griggs v. Duke Power  
Prohibited denial of employment opportunities to minorities even if not intentional discrimination.
- 1973 – Adams v. Richardson  
Ended segregation of higher education where there were dual systems. Ordered recruitment of students and faculty to other-race institutions.
- 1978 – Regents of the University of California v. Bakke  
Declared race specific quotas in medical school admissions impermissible, but approved taking race into account as a factor in admissions.
- 1979 – United Steelworkers of America v. Weber  
Upheld a minority set-aside provision entered into voluntarily as meeting a “compelling interest” in ending industry-wide discrimination that exhibited “manifest racial imbalance.”
- 1984 – Firefighters Local 1784 v. Stotts
- 1986 – Wygant v. Jackson Board of Education  
Both cases affirmed two principles: 1) affirmative action in hiring minorities is allowable without proof of specific discrimination; and 2) layoff plans cannot protect minorities with less seniority.

- 1986 – Local 93 v. City of Cleveland  
Approved a voluntary consent decree that established hiring goals for minorities even though they suffered no prior discrimination.
- 1986 – Local 28 of Sheetmetal Workers v. EEOC  
Permitted a 29 percent race-conscious hiring goal where “a labor union has engaged in...egregious discrimination”; minorities hired need not be the actual victims of discrimination.
- 1987 – Johnson v. Transportation Agency  
Approved hiring of a qualified woman whose score was two points lower than the rejected male when there was “manifest gender imbalance” but no finding of discrimination.<sup>16</sup>
- 1989 – Richmond v. I.A. Croson Co.  
Disallowed state-ordered set-aside programs, even where intent is remedial, if plans do not meet “strict scrutiny” standard.
- 1989 – Wards Cove Packing Co. v. Atonio  
Shifted burden of proof of discrimination to minorities despite demonstrable disparity in jobs.
- 1989 Martin v. Wilks  
Ruled that whites may challenge affirmative action policies that they previously agreed to, with no deadlines for such challenges.
- 1993 Hopwood v. Texas  
Ruled that while recruitment of minorities for law school was a “lawful objective,” a process that excluded certain students was unconstitutional. (Under appeal.)

As can be seen, little clear-cut legal reasoning runs through these court decisions. They start out liberal and, as the composition of the Supreme Court changes in the 1980s, they become more narrowly construed and require affirmative action plans to meet “strict scrutiny” standards. President Clinton has had the opportunity to appoint two justices, but it is uncertain how the present Court, with its liberal/conservative balance, will rule in individual cases. For example, its refusal to hear an appeal of the recent case of Kirwan v. Podberesky, in which the Fourth Circuit Court of Appeals found a scholarship program at the University of Maryland targeted at high-achieving blacks to be illegal, gives no guidance on how the Court will rule in other, similar cases.

However, one thread does run clearly through all of these decisions—the one articulated by Assistant Attorney General Deval Patrick. The Supreme Court has held consistently that the principle of affirmative action could be upheld if the plan to implement it was narrowly tailored, met the “strict scrutiny” standard, was intended to remedy a specific wrong, and (presumably) was intended as a temporary measure. These standards are difficult to meet but, nevertheless, if they still obtain, may be the best that supporters of affirmative action have to hold on to in these perilous times.

## V. Affirmative Action: Victories and Promise

Affirmative action is first and foremost a legitimized constitutional remedy for past discrimination. It is a remedy in keeping with the basic principle that where there is a constitutional violation, there must be a remedy appropriate in scope to that violation.

Vernon Jordan  
Former President  
National Urban League  
1986

Affirmative action has had dramatic and measurable results in moving minorities and women into meaningful employment in industry and increasing their participation in higher education as students, faculty, and administrators. This progress has not come without difficulty and has been challenged by lawsuits and filings of reverse discrimination appeals with the Equal Employment Opportunity Commission.

Table III  
Construction Firms Owned  
by Minorities and Women

	<u>1972</u>	<u>1987</u>
Minorities	39,875	107,650
<u>Women</u>	<u>14,884</u>	<u>94,308</u>

Source: Census Bureau, 1992.<sup>17</sup>

In private industry, minority and female-owned construction firms have gained a foothold in this most homogeneous of industries, and mostly through affirmative action. Previously, minority firms were too small to bid on competitive contracts and white-owned firms seldom took them on as subcontractors. As a result, their firms got only an infinitesimal share of the construction business. With affirmative action, however, cities and local governments began to set aside a portion of their construction business or required large white-owned firms to subcontract with firms owned by minority men and women of all races. However, the Croson decision may hamper progress in this area, and President Clinton has hinted that minority set-asides may be eliminated after his review of federal affirmative action programs.

Other areas of employment also have shown dramatically measurable results through aggressive implementation of affirmative action plans or their enforcement by the courts. For example, a consent decree obtained in an AT&T case increased the number of black women in skilled clerical positions by 65 percent in 1978-79. Large jumps in minority and female employment among sheet metal and electrical workers also were recorded.<sup>18</sup>

Table IV  
Percentage of Minority and Women  
Police Officers In 50 Largest Cities

	<u>1983</u>	<u>1992</u>
Blacks	12.4	17.3
Hispanics	6.8	8.3
<u>Women</u>	<u>NA</u>	<u>11.6</u>

Source: University of Nebraska, 1994.

In 1973, the Los Angeles Fire Department was 100 percent male and 94 percent white. A federal court secured a consent decree from the LAFD with specific affirmative action targets. Today, 1995, the LAFD is 26 percent Hispanic, 13 percent African American, 6 percent Asian and 4 percent women. This is a good beginning in a city that is 66 percent minority. However, the top officers, at the rank of battalion commander and above, remain virtually all white.<sup>19</sup>

Nevertheless, the examples in Table IV (and others like it from some of the nation's large cities) refute the charge by some critics that affirmative action benefits only middle-class minorities. Studies show minorities have made gains in occupations not usually associated with advantaged status, such as law enforcement, fire fighting, and skilled construction work. Moreover, other studies show that of "the increased enrollment of minority students in medical school..., significant numbers were from families of low income and job status."<sup>20</sup>

## VI. Minorities and Women in Higher Education

The impact of affirmative action on the employment and enrollment of underrepresented groups in higher education is the principal focus of this essay. However, we cannot discuss this issue meaningfully outside of the context of the difficult history described heretofore and the racial and sexual oppression that led up to the present. Some limited progress has been made by minority men and women of all races in higher education despite the many obstacles to their advancement and the continuous resistance they have encountered.

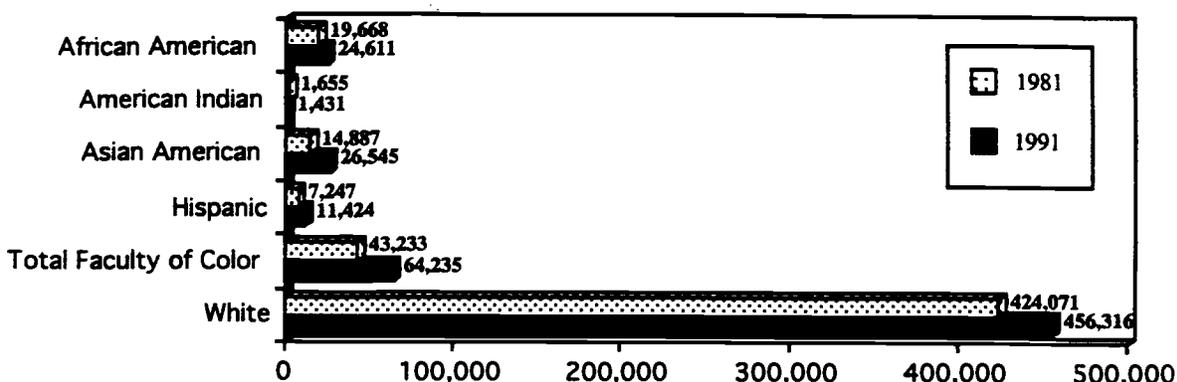
Table V  
Percentage of Women Faculty and Ph.Ds  
1890-1989

<u>Year</u>	<u>Faculty</u>	<u>Ph.Ds Awarded</u>
1890	19.6	1.3
1900	19.8	6.0
1910	20.1	9.9
1920	26.3	15.1
1930	27.2	15.4
1940	27.6	13.0
1950	24.5	9.6
1960	22.0	10.5
1970	23.1	13.3
1980	29.0	29.7
1989	30.3	37.7

Sources: 1890-1980: *Digest of Education Statistics 1989* (Washington, DC: National Center for Education Statistics, 1989), p. 166. 1989: *Minorities in Higher Education* (Washington, DC: American Council on Education, 1991), pp. 59-63.

As can be seen in Table V, even white women, who constitute 40 percent of the population, have been moving up slowly in faculty numbers but have yet to reach parity. While 30.3 percent of faculty members in 1989 were women, 26 percent were white women. All minority women faculty members combined represented 4 percent. Neither group is proportionately represented. Ending affirmative action would seriously impede the progress of white women, but it would have a devastating impact on the precarious hold minority women have on faculty positions.

**Figure I**  
**Number of Full-Time Faculty in Higher Education**  
**by Race/Ethnicity, 1981 and 1991**



Source: U.S. Equal Employment Opportunity Commission. "EEO-6 Higher Education Staff Information Survey," 1981 and 1991.

Figure I indicates that while minority faculty (men and women) have made some limited gains, again due mostly to affirmative action, they still represent collectively a minuscule percentage of the total.

**Student Enrollment**

**Table VI**  
**Minorities as Percentage of Student**  
**Enrollment in Higher Education**

	<u>1981</u>	<u>1993</u>
Four-Year Institutions	14	20
Two-Year Institutions	<u>20</u>	<u>27</u>
<u>Total</u>	<u>17</u>	<u>23</u>

Source: American Council on Education, 1995.<sup>21</sup>

Minority student enrollment at colleges and universities increased modestly but steadily from 1981 to 1993, as shown in Table VI. However, enrollment has increased slightly more in two-year institutions than in four-year institutions. The downturn in the economic circumstances of some minorities (American Indians and African Americans) and the rapid escalation of tuition during the past decade may have resulted in a "bumping down" of students into lower cost community colleges. While community colleges serve an important purpose, increased enrollment in two-year rather than four-year institutions by minority students lowers their likelihood of attaining a bachelor's degree. Moreover, this "bumping down" phenomenon may have led to fewer highly qualified minority students applying to the more expensive and prestigious universities, making the affirmative action competition for these students even more fierce. It is ironic that the topic of affirmative action in admissions is heating up while the number of black students at many of our leading universities is declining.

**Table VII**  
**Percentage of Black Undergraduate Enrollment**  
**at Selected Research Universities**

<u>Institution</u>	<u>1980</u>	<u>1992</u>	<u>Percent Change</u>
Brown University	6.2	5.8	-6.5
University of Chicago	4.1	3.7	-9.8
Stanford University	6.1	5.2	-14.8
Columbia University	6.2	5.0	-19.4
Cornell University	5.0	4.0	-20.0
Northwestern University	8.2	6.1	-25.6
Princeton University	7.5	5.3	-29.3
Dartmouth College	7.7	5.4	-29.9
<u>Mass. Inst. of Technology</u>	<u>5.4</u>	<u>3.5</u>	<u>-35.2</u>

Source: *Journal of Blacks in Higher Education*, 1994.<sup>22</sup>

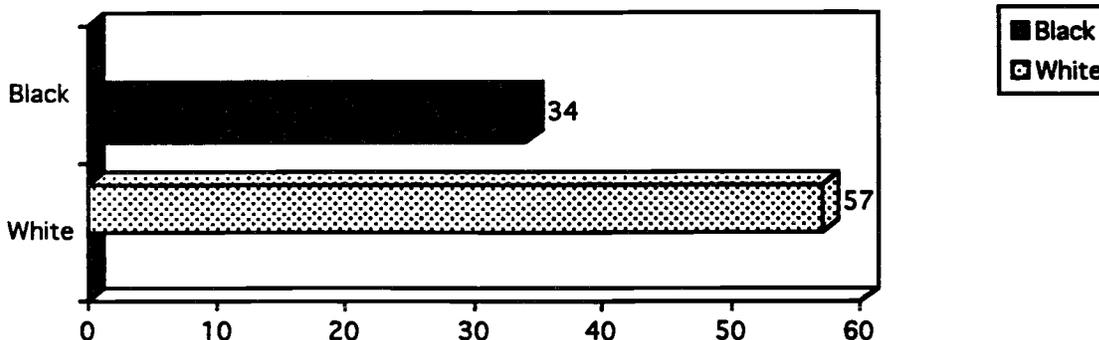
In their recent controversial book, *The Bell Curve*, Richard Herrnstein and Charles Murray claim that "black students become Harvard dropouts instead of University of Texas graduates," and that "getting discouraged about one's capacity to compete in an environment may be another cost of affirmative action."<sup>23</sup> Regrettably, Herrnstein and Murray never checked their facts. Table VIII shows the relevant black student graduation rates at a number of the nation's most selective schools and at the University of Texas.<sup>24</sup>

**Table VIII**  
**Black Graduation Rates at**  
**Selected Institutions (%)**

<u>Institution</u>	<u>Graduation Rate</u>
Harvard University	92
Wesleyan University	90
Yale University	88
Williams College	88
<u>University of Texas</u>	<u>44</u>

Source: *Journal of Blacks in Higher Education*, 1994/95.

**Figure II**  
**Six-Year College Graduation Rates**  
**for Black and White Students (%)**



Source: *Journal of Blacks in Higher Education*, 1994.

Not only do black students do very well at the nation's most selective colleges and universities, but in most cases their graduation rate, compared with that of white students, is better at the most selective schools than at less selective institutions.<sup>25</sup>

Justice Lewis Powell, in his controlling decision in the *Bakke* case, cited Harvard's student admission policies as a particularly exemplary way a college could take various factors into consideration to achieve a racially diverse student body. An ideal college admission policy would weigh all these factors in considering the makeup of its freshman class: SAT (or ACT) scores, high school GPA, leadership and community service, special talents (music, athletics, etc.), geographic diversity, and racial diversity. Then any students needing academic help would receive it regardless of race or gender.

As Powell understood, without affirmative action, minority students might not be admitted into many colleges and universities. Yet, while affirmative action might be necessary, it is not a sufficient change mechanism for effectively serving all students.

An example of what to do and what not to do in college admissions is illustrated by two cases. Georgetown University Law Center has an excellent record in minority admissions, but never publicized its admission policies.<sup>26</sup> The school was embarrassed when a white student leaked information that the scores of Georgetown's black law students on average were somewhat lower than those of its white students. The story received wide publicity. Georgetown's dean, in an eloquent letter to the editor published in the *Washington Post*, defended the school's admission policies, but the damage had been done.

In contrast, Rutgers University Law School widely publicized its Minority Student Program (which accepts marginally qualified whites as well). Minority students with good records must compete in the regular admission pool. Students and faculty take pride in being in the MSP, and graduation rates are good. Some of the top black lawyers in the State of New Jersey are graduates of the MSP.<sup>27</sup>

The moral of the story is to take pride in a school's affirmative action policies, publicize the goals of the program widely, and aggressively educate all students about the program and how it enriches the school and adds to its reputation. Hiding or under-publicizing a program only will lead to the suspicion that it is less than worthy.

### White Male Anger

In higher education, as in other areas, it is the perception of lost position rather than the reality that fuels white male anger. In 1973, there were 18,873,000 white Americans between the ages of 18 and 24 who were high school graduates. By 1993, due to falling birthrates among whites, this figure had declined to 16,196,000. However, in 1973, only 30 percent of white high school graduates entered college, whereas in 1993, that share had grown to 42 percent. Thus, despite a substantial drop in their overall numbers, more white high school graduates are going to college. The pattern of increased college participation holds true for every ethnic group—African Americans, Hispanics, Asian Americans, and American Indians. Nearly 15 million students now are enrolled in college, and participation by every racial group has increased.<sup>28</sup> That is partly what the anger on campuses is about—not that minorities are taking white places, but that whites, and everyone else, want even more spaces! Yet, whites nationally constitute 75 percent of the student body, earn 88 percent of the Ph.D.s awarded to U.S. citizens, are 87 percent of the college administrators, and hold 87 percent of the full-time faculty positions.

The growth of minority participation in higher education has been modest at best, but it is the perception of the loss of majority privilege that politicians have seized upon and irresponsibly whipped into a frenzy. That fact makes it exceedingly difficult to hold a dispassionate discussion about affirmative action.

## **Business Acceptance of Affirmative Action**

On the other hand, business and industry leaders are well ahead of the higher education elites in accepting affirmative action as sound policy. A study based on data from 1966 to 1992 shows that "companies that implement quality affirmative action programs benefit economically through a higher evaluation of their company stock by investors. Discriminatory practices are viewed negatively by investors, which means lower stock prices," according to the study.<sup>29</sup>

Nor are local governments scrambling to eliminate affirmative action. A survey for the U.S. Conference of Mayors revealed that 40 percent of the city officials believed that affirmative action programs contributed to improved job efficiency and productivity. In addition, 60 percent of the cities had fewer employee grievances, 45 percent reported declines in employee turnover rates, and 40 percent had less absenteeism. The mayors' report concluded that the pursuit of a color-blind society to achieve fairness in hiring and promotion was "ideal but unrealistic."<sup>30</sup> Or as Gery Chico, Mayor Richard M. Daley's chief of staff, stated succinctly, "We don't care what Clinton does. We're not going to change a thing."<sup>31</sup>

## **VII. Affirmative Action: Failure and Resistance**

The only way we will ever get to a color-blind society is for government...to stop discriminating on the basis of race. A ban on racial preferences will go a long way to remove the venom from race relations.

Clint Bolick  
Institute for Justice  
April 1, 1995

Affirmative action has had its share of failures, either through inadvertence (as with any new program), overzealousness in enforcement of its many complex rules, or intent, as a result of deliberate efforts to embarrass its supporters or to make the program fail. In addition, opponents of affirmative action advance a number of arguments that should be answered forthrightly. Among the latter are these:

- **Affirmative action has not helped minorities.** This statement is repeated often. Citing black unemployment rates, which have remained twice as high as those of whites, Farrell Bloch, an economist, argues that "the evidence demonstrates that affirmative action has not significantly enhanced the employment prospects for the most disadvantaged African Americans."<sup>32</sup>

The unemployment rates of low-skilled blacks have remained disastrous since assembly line jobs began disappearing from Rustbelt factories. While some low-skill jobs are available in the suburbs, most urban blacks have no way of getting to them. In addition, to be employable, these blacks will have to be retrained—a massive undertaking for which neither the federal government nor state governments have much enthusiasm in these fiscally stringent times. Thus, these people are out of reach of help from affirmative action; it is irrelevant to their circumstances. Nonetheless, the considerable improvement in minority employment in law enforcement, firefighting, and construction, as well as in medicine and law, can be cited as a signal victory of affirmative action. Moreover, minorities have made measurable strides in employment in business and industry due to aggressive targeted hiring.

- **Affirmative action has caused reverse discrimination against whites.** Mortimer B. Zuckerman, editor-in-chief of *U.S. News and World Report*, stated in a recent editorial that "A program to end discrimination in the name of justice became a program to visit injustice on a different set of people."<sup>33</sup>

A 1995 analysis by the Labor Department found that affirmative action programs do not lead to widespread reverse discrimination claims by whites, and a high proportion of such claims that are filed are found to lack merit. The findings contradicted charges that affirmative action has helped minorities at the expense of white males. The analysis found that fewer than 100 out of 3,000 discrimination cases filed involved reverse discrimination, and in only six cases were such claims substantiated. "The paucity of reported cases casts doubt on the dimension of the reverse discrimination problem," the report said.<sup>34</sup>

- Persons should be selected for positions based on merit alone. Usually, when people say "merit," they mean the scores on a test or examination or some other quantitative ranking. However, as the spokesperson for the University of California Medical School said recently: "Medical school is not a reward for high test scores or grades. Medical schools have to decide who is going to fulfill the most pressing needs of society, and that doesn't correlate extremely well with test results and grades."<sup>35</sup> Cultural sensitivity toward persons from different backgrounds, interpersonal skills, the ability to communicate effectively—all these are "meritorious" qualifications that relate to an individual's performance on the job.

Moreover, the case of Johnson v. Transportation Agency, the federal courts held that a woman with slightly lower scores than a white male's, if qualified, should be selected for a job where women were conspicuously absent from the work force. Finally, in The Bell Curve, Herrnstein and Murray imply that minorities in the District of Columbia would be better served by well-trained police officers who scored high on selection tests. It is questionable whether the citizens of the District of Columbia (or Los Angeles) would feel better served by police officers who were selected only for their high scores. "Merit" involves much more than the ability to perform well on paper and pencil tests.

- Affirmative action produces a feeling of inferiority in minority men and women of all races and creates a negative stereotype in the mind of white males. Both of these statements have been repeated over and over until they have assumed the permanence of fact. However, the fact is that no national survey of affirmative action recipients ever has been done, and the stories are mostly anecdotal or speculative.

One black sociology professor, reacting to the anecdotal thesis that affirmative action harms blacks, stated forcefully, "I have never felt stigmatized, nor have I concerned myself with whether or not whites viewed my presence or success as undeserved."<sup>36</sup> The contention that affirmative action creates a negative stereotype in the minds of whites implies naively that whites had no negative stereotypes of minorities in their minds before. That theory goes counter to the nation's history. "Any stigma or negative stereotypes associated with race have existed in this country long before affirmative action was ever thought of."<sup>37</sup> Moreover, no stigma seems to be felt by the sons and daughters of alumni or athletes who are admitted to college with less than competitive qualifications.

- We should have a color-blind society. That's what Martin Luther King wanted. Justice Harry Blackman's opinion in the Bakke case is the most eloquent response to this contention:

I suspect that it would be impossible to arrange an affirmative action program in a racially neutral way and have it successful. To ask that this be so is to demand the impossible. In order to get beyond racism, we must first take account of race. There is no other way. And in order to treat some persons equally, we must treat them differently. We cannot—dare not—let the Equal Protection Clause perpetuate racial supremacy.<sup>38</sup>

While the foregoing provides answers to the criticisms often leveled at affirmative action, a number of charges have arisen based on recent cases that are more serious and must be faced squarely. These are some of the more troubling ones:

- Affirmative action allows minorities to buy something under a minority set-aside and sell it at a profit. The purpose of a minority set-aside is to create more minority businesses, not to be used as a conduit to turn a quick profit. The case cited is the purchase of a TV station license by a minority male who then sold it to a white person four months later at a substantial profit. This is an abuse of the set-aside.<sup>39</sup>
- A minority person can be used as a front for a white controlled firm. The case cited is a construction firm ostensibly owned by a minority that in actuality was a front for a white firm that did the work and “kicked back” some of the profits to the minority. They were prosecuted and paid heavy fines. Such abuses are widespread in both minority- and women-owned firms and cast a cloud over all set-asides.<sup>40</sup>
- Young minorities joining the work force expect that affirmative action will get them promoted. The case cited involves young minority police officers who expect to get promoted without trying because of affirmative action. This is one of the most serious charges because it deals with an attitude that destroys the effectiveness and purpose of affirmative action. The program is intended to get one in the door, but one has to prove oneself after that.<sup>41</sup> It is not clear how pervasive this attitude is, but if it is widespread, it would have damaging consequences for the perception of affirmative action.

The critics of affirmative action constantly raise such charges to attack the entire principle. The defenders of affirmative action will be more credible if they admit that some programs have serious flaws that will have to be addressed. This will require better monitoring of setaside programs and putting minorities on notice that they will have to prove themselves once on the job. Such improvements may not be enough to save all programs that have been enacted in the name of affirmative action. Though it may be painful, some parts may have to be excised to save the body of the principle.

The difficulty of defending affirmative action is compounded by the fact that minority individuals are among its most vocal critics (and, as a result, are given excessive media attention). Shelby Steele, Stephen Carter, Thomas Sowell, Linda Chavez, Armstrong Williams, and Richard Rodriguez are some of the most well known. The media assault on affirmative action, plus the prominence given minority critics, has resulted in the minority community giving it only tepid support (51 percent of blacks in favor, according to one poll; 77 percent of white women opposed, according to another).

As Secretary of Labor Robert Reich has argued, “angry white males” are venting their frustrations at minorities and women when the real problem they face (along with everyone else) is an increasingly competitive global economy that has produced massive changes in the domestic economy and drastically altered the nature and demands of the job market.

## VIII. Is Affirmative Action Still Necessary?

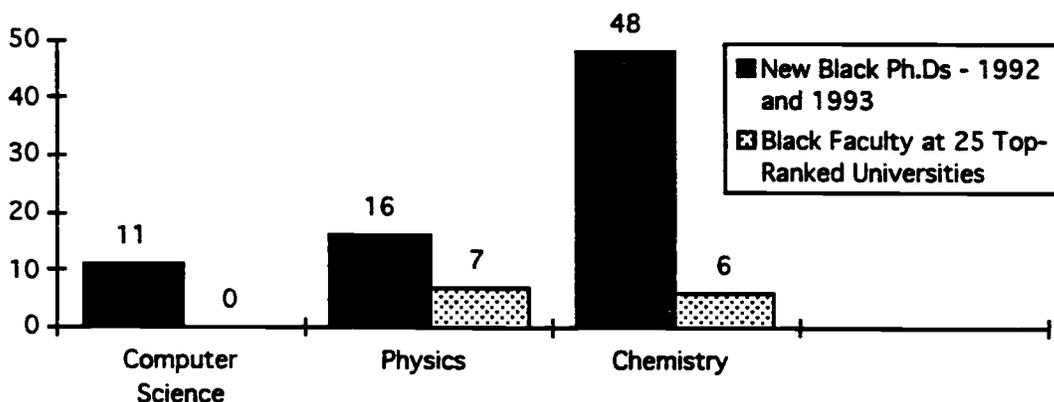
We hope that race and other minority status will be much less of a distinguishing feature of American society in the future as we overcome the consequence of past discrimination in education and elsewhere. Race or other minority status would thus become less germane to achieving diversity in student bodies and to ensuring prospective service to the public.... Significant progress has already been made within higher education, but there is still a substantial way to go.

Carnegie Commission on Higher Education, 1977

That statement of nearly two decades ago shows how naively optimistic we were about the possibility of rapid change in the field of higher education. The following illustrations demonstrate that resistance to such change is characteristic of other areas of society as well.

- In 1990, an Urban Institute study utilizing pairs of black and white job applicants with identical credentials found that in 476 hirings in Washington, DC and Chicago, "unequal treatment of black job seekers was entrenched and widespread, contradicting claims that hiring practices today either favor blacks or are effectively color blind. In 20 percent of the audits, whites were able to advance further through the hiring process than equally qualified blacks.... [A] similar study using Hispanic job applicants found them discriminated against 29 percent of the time in San Diego and 33 percent of the time in Chicago."<sup>42</sup>
- In 1994, the Chevy Chase Federal Savings Bank agreed to an \$11 million settlement of a lawsuit in which they were charged with "redlining" in mortgage lending by refusing to serve minority neighborhoods in Maryland.<sup>43</sup>
- In 1992, New York Manufacturers Hanover Trust rejected 18 percent of loan applications from high income whites, but rejected more than twice as many—43 percent and 45 percent—from high income African Americans and Hispanics.<sup>44</sup>
- A study of faculty hiring practices found that once a minority hiring goal was met, departments stopped seeking out minority applicants and, indeed, pulled their ads from minority publications, regardless of the number of vacancies that occurred subsequently.<sup>45</sup>

Figure III  
Number of New Black Ph.Ds Awarded in the  
Natural Sciences and Number of Graduates Recruited  
to the Faculties of the Highest-Ranked Universities



Source: *Journal of Blacks in Higher Education*, 1995.

These examples illustrate how institutions slip into old practices even when those practices are strictly forbidden by law (for example, redlining). In spite of affirmative action, employers tend to favor whites, particularly white males, over equally qualified African-American or Hispanic applicants. As Crosby and Clayton have pointed out:

Much white male resistance to affirmative action may spring from an unwillingness on the part of any given white man to recognize the true extent to which his gender and his ethnicity, and not simply his own individual merit, have won him rungs on the ladder of success.<sup>46</sup>

Minorities—particularly minority females—on average are clustered on the lower rungs of the professoriate as assistant professors and non-tenure track lecturers, and their presence is tenuous at best. The possibility of their developing a critical mass and thereby becoming self-perpetuating can be assured only with a continuation of some form of affirmative action.

## IX. Conclusion

Negro political rights cannot be widely won through court actions until the white community is at least no longer violently hostile to their exercise by Negroes. No legislation can bring about overnight changes in peoples' morals, nor can any decisions of the Supreme Court do so.

Supreme Court Justice Hugo Black

House Minority Leader Richard Gephardt (D-MO) has spoken out strongly in favor of affirmative action, noting, "there may be abuses that should be corrected, but we should not abandon the effort to stop discrimination and to see that people are treated fairly."<sup>47</sup> Senator Bill Bradley (D-NJ) has spoken out just as forcefully. Business leaders are equally forthright. As Avon Products CEO James Preston put it, "managing diversity is not something we do because it's nice but because it's in our interest."<sup>48</sup>

Equally strong voices are needed in academia speaking in support of the principle of affirmative action, providing "teachable moments" to educate students and faculty as to why it is needed and why it is enriching to everyone, and criticizing those elements of the program that have not worked well.

Leaders also need to critique carefully those policies that have been advanced as alternatives to affirmative action but that will not work:

Race neutral or color blind: a policy that sounds good in the abstract but never works in reality because 1) progress or failure cannot be measured; and 2) it degenerates into the practice of business as usual, favoring mostly white males.

Policies based on need rather than race: as Representative Gephardt states, "The United States has never had a history of discrimination against people who are in poverty that is at all comparable to the barriers facing women and minorities."

Though they sound attractive, policies based on need would fundamentally shift the purpose of the program away from compensating for prior discrimination. Moreover, the federal government currently has programs that address need and that should be expanded: Head Start, Upward Bound, Talent Search, Pell Grants, etc.

Lastly, the defenders of affirmative action should be the first to criticize those programs that do not work: set-asides that are abused, quotas that are introduced illegally, hiring unqualified minorities to fill token slots, etc. Only if we criticize our mistakes will we retain our credibility. In the present climate of the political assault on affirmative action, it is all the more important to speak out with a strong voice to defend what is right and what is working well.

Despite all of the laws and arguments on behalf of and in opposition to affirmative action, in the final analysis, affirmative action is not a legal question but a political and societal one. The question facing American society is whether it wishes to achieve equality and fairness for all of its citizens, after years of injustices to minorities and women, and how it proposes to do it. The questions confronting the academy are whether diversity is a legitimate goal; whether achieving a diverse student body is an educational value; and what is the educational role and purpose of higher education.

Racism and sexism are currents that run deep in the American mainstream. They will not easily be diverted. They have a tenacious hold on people who go to extraordinary lengths to rationalize them with sophisticated intellectual arguments. Affirmative action is a limited tool of the courts and Congress that, with all its clumsy complexity, was created to deal with only limited aspects of racism and sexism. That it has achieved some modest amelioration is remarkable. That we should expect it to do much more would be wishful thinking. We must constantly devise new strategies for the even more difficult struggles ahead.

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Memorandum, Congressional Research  
Service, Library of Congress

**APPENDIX II**



This information was prepared by the American Law Division of the Congressional Research Service, Library of Congress (2/17/95), at the request of Robert Dole, Rep.-Kan.

We have included any statute, regulation, or executive order uncovered by our research which appears, in any manner, to prefer or consider race, gender, or ethnicity as factors in federal employment or the allocation of federal contracts or grants to individuals or institutions. Several laws and regulations directed to "socially and economically disadvantaged" individuals and institutions are included because, as explained *infra*, that term has been defined administratively and by statute to presumptively apply to specific racial and ethnic minorities. As a background for understanding operation of the numerous listed federal laws and regulations, more extensive discussion is devoted at various points to the development of major "affirmative action" programs in federal grant, contract, and employment law.

## FEDERAL GRANT AND PROCUREMENT LAW

Federal efforts to increase minority and female participation in contracting, federally assisted programs, and employment have been a major aspect of civil rights enforcement for more than three decades. Congress and the Executive Branch have crafted a wide range of federal laws and regulations authorizing, either directly or by judicial or administrative interpretation, race or gender "conscious" strategies in relation to jobs, housing education, voting rights, and governmental contracting. The historical model for federal laws and regulations establishing minority participation "goals" may be found in Executive Orders which since the early 1960's have imposed affirmative minority hiring and employment requirements on federally financed construction projects and in connection with other large federal contracts. Presently, Executive Order 11246 as administered by the Office of Federal Contract Compliance Programs (OFCCP) requires that all employers with federal contracts in excess of \$50,000.00 must file written affirmative action plans with the government. These are to include minority and female hiring goals and timetables to which the contractor must commit its "good faith" efforts. Similar affirmative action measures relating to federal government employment were enacted as part of the Equal Employment Opportunity Act Amendment of 1972 and the 1978 Civil Service Reform Act.

Affirmative action for minority entrepreneurs soon became a focus of efforts by the Small Business Administration (SBA) and other federal agencies to assist "socially and economically disadvantaged" small businesses under a variety of federal programs. Increasingly, an "affirmative action" model, in the form of participation "goals" or "set-asides" for members of racial or ethnic minorities, and businesses owned or controlled by these or other "disadvantaged" persons, found legislative expression in a wide range of federal programs.

The Small Business Act, as amended, provides the statutory prototype for a host of federal programs to increase minority and female participation as contractors or subcontractors on federally funded projects. First, the "Minority Small Business and Capital Ownership Development," or § 8(a) program authorizes the Small Business Administration (SBA) to enter into all kinds of construction, supply, and service contracts with other federal departments and agencies. The SBA acts as a prime contractor and then "subcontracts" the performance of these contracts to small business concerns owned and controlled by "socially and economically disadvantaged" individuals, Indian Tribes or Hawaiian Native Organizations.

Applicants for § 8(a) certification must demonstrate "socially disadvantaged" status or that they "have been subjected to racial or ethnic prejudice or cultural bias because of their identities as members of groups without regard to their individual qualities." The Small Business Administration "presumes," absent contrary evidence, that small businesses owned and operated by members of certain groups—including Blacks, Hispanics, Native Americans, and Asian Pacific Americans—are socially disadvantaged. Any individual not a member of one of these groups must "establish his/her individual social disadvantage on the basis of clear and convincing evidence" in order to qualify for § 8(a) certification. The § 8(a) applicant must, in addition, show that "economic disadvantage" has diminished its capital and credit opportunities, thereby limiting its ability to compete with other firms in the open market.

The "Minority Small Business Subcontracting Program" authorized by § 8(d) of the Small Business Act codified the presumption of disadvantaged status for minority group members that applied by SBA regulation under the § 8(a) program. Prime contractors on major federal contracts are obliged by § 8(d) to maximize minority participation and to negotiate a "subcontracting plan" with the procuring agency which includes "percentage goals" for utilization of small socially and economically disadvantaged firms. To implement this policy, a clause required for inclusion in each such prime contract states that "[t]he contractors shall presume that socially and economically disadvantaged individuals include Black Americans, Hispanic Americans, Native Americans, Asian Pacific Americans, and other minorities, or any other individual found to be disadvantaged by the Administration pursuant to § 8(a)..." Accordingly, SBA has discretion in designating a firm or individual as socially and economically disadvantaged for purposes of both the § 8(a) and § 8(d) programs in conformity with specified criteria.

These obligations, first codified in 1978 as an amendment to the SBA, were augmented a decade later by the Business Opportunity Development Reform Act of 1988. Congress there directed the President to set annual, government-wide procurement goals of at least 20 percent for small businesses and 5 percent for disadvantaged businesses, as defined by the SBA. Simultaneously, federal agencies were required to continue to adopt their own goals, compatible with the government-wide goals, in an effort to create "maximum practicable opportunity" for small disadvantaged businesses to sell their goods and services to the government. The goals may be waived where not practicable due to unavailability of disadvantaged business enterprises (DBEs) in the relevant area and other factors. While the statutory definition of DBE includes a racial component, in terms of presumptive eligibility, it is not restricted to racial minorities but also includes persons subjected to "ethnic prejudice or cultural bias." It also excludes businesses owned or controlled by persons who, regardless of race, are "not truly socially and/or economically disadvantaged." Federal Acquisition Act amendments adopted in 1994 amended the 5 percent minority procurement goal, and the minority subcontracting requirements in § 8(d), to specifically include "small business concerns owned and controlled by women" in addition to "socially and economically disadvantaged individuals."

In addition, Congress has frequently adopted "set-asides" or other forms of statutory preference for "socially and economically disadvantaged" firms and individuals, following the definitions of the Small Business Act, or by designating minority groups and women as part of specific grant or contract authorization programs. Thus, targeted funding, in various forms, and minority or disadvantaged business set-asides or preferences have been included in major authorization or appropriation measures for agriculture, communications, defense, education, public works, transportation, foreign relations, energy and water development, banking, scientific research and space exploration, and other purposes. Other federal laws appear to authorize some consideration of race or gender to enhance the participation of minorities and women in federal programs or employment but without directly mandating preferential goals or set-asides.

The following statutes, regulations, and executive orders governing federal contracts and grant programs are, to the extent possible, grouped according to agency and subject matter.

### Federal Acquisitions Regulations - General

Statute/Reg./Exec. Order #	Summary
48 C.F.R. § 19.001(b) (1994)	"Individuals who certify that they are members of named groups (Black Americans, Hispanic Americans, Native Americans, Asian-Pacific Americans, Subcontinent-Asian Americans) are to be considered socially and economically disadvantaged" for purposes of "Socioeconomic Programs" under the Federal Acquisitions Regulation (FAR).
48 C.F.R. § 19.704 (1994)	FAR requirement that "[s]eparate percentage goals for using small business concerns and small disadvantaged business concerns as subcontractors" be included in small disadvantaged business subcontracting plans.
48 C.F.R. § 19.706(c)(2) (1994)	FAR subcontracting assistance program states that "[v]arious approaches may be used in the development of small and small disadvantaged business concerns subcontracting incentives. They can take many forms, from a fully qualified schedule of payments based on actual subcontract achievement to an award fee approach employing subjective evaluation criteria...The incentive should not reward the contractor for results other than those that are attributable to the contractor's efforts under the incentive subcontracting program" See also § 19.705-1 (monetary incentives for exceeding goals).
48 C.F.R. §§ 52.219-8, 52.219-9 (1994)	Prescribe clauses for inclusion in federal prime and subcontract which require, inter alia, "[g]oal, expressed in terms of percentages of total planned subcontracting dollars, for the use of small business concerns and small disadvantaged business concerns as subcontractors."

## Agriculture

Statute/Reg./Exec. Order #	Summary
7 U.S.C.S § 3154(c)	The Secretary of Agriculture is authorized "to set aside a portion of funds" appropriated for certain research on the production and marketing of alcohols and industrial hydrocarbons for grants to colleges and universities to achieve "the objective of full participation of minority groups."
7 C.F.R. § 225.6(g)(xi) (1994)	Food service management companies participating in the Summer Food Service Program must submit with appropriate state agency a registration which is to include "a statement as to whether the organization is a minority business enterprise" managed and controlled by "Blacks, Hispanics, American Indians, Alaskan Natives, Oriental and Aleuts..."
7 C.F.R. § 246.13(g) (1994)	Financial management system maintained by state agencies participating in Special Supplemental Food Program for Women, Infants and Children are "encouraged" to use minority- and women-owned banks.
7 C.F.R § 272.4(b) (1994)	Bilingual program information and certification, and interpreters must be provided in certain low income areas with specified percentages of non-English speaking minority households under Food Stamp and Food Distribution Program.
7 C.F.R. § 1940.968(k)(3) (1994)	States participating in certain rural economic development programs are "encouraged to use minority banks (a bank which is owned by at least 50 percent minority group members) for the deposit and disbursement of funds."
7 C.F.R. § 1942.17(p)(3)(iii) (1994)	Applicants for certain FmHA community facilities loans are "encouraged to use minority banks (a bank which is owned by at least 50 percent minority group members) for the deposit and disbursement of funds."
7. C.F.R. § 1942.472(c) (1994)	Grantees of certain rural housing and community development technical assistance and training grants are "encouraged to use minority banks (a bank which is owned by at least 50 percent minority group members) for the deposit and disbursement of funds."
7 C.F.R. § 1944.526(a)(2)(i)(D) (1994)	Preapplication process for Technical and Supervisory Assistance Grant program considers in determining applicant eligibility "the estimated number of low income and low income minority families the applicant will assist in obtaining affordable adequate housing."
7 C.F.R. § 1944.671(b) (1994)	Equal Opportunity and outreach requirements applicable to FmHA Housing Preservation Grants program state that "[i]n a measure of compliance, the percentage of the individuals served by the HPG grantee should be in proportion to the percentages of the population of the service area by race/national origin."
7 C.F.R. §§ 3015.13, 3016.21(h) (1994)	"Consistent with the national goal of expanding opportunities for minority business enterprises, recipients and subrecipients" of federal financial assistance administered by the Department of Agriculture "are encouraged to use minority and women-owned banks. Upon request, awarding agencies will furnish a listing of minority and women-owned banks to recipients."

<p>7 C.F.R. 3051 APPENDIX A (1994)</p>	<p>OMB Circular A-133, Audits of Institutions of Higher Education and Other Nonprofit Institutions. "11. Small and Minority Audit Firms. Small audit firms and audit firms owned and controlled by socially and economically disadvantaged individuals shall have the maximum practicable opportunity to participate in contracts awarded to fulfill the requirements of this circular." See also OMB Circular A-128 (.19)(Uniform Audit Requirements for State and Local Governments), 29 C.F.R. Part 96 APPENDIX A (1994).</p>
<p>7 C.F.R. §§ 3403.1, 3403.2 (1994)</p>	<p>USDA regulations implementing small business innovation grants program which as one of its goals is to "foster and encourage minority and disadvantaged in technological innovation." For purposes of this program "minority and disadvantaged individual is defined as a member of any of the following groups: Black Americans, Hispanic Americans, Native Americans, Asian Pacific Americans, or Subcontinent Asian Americans."</p>
<p>48 C.F.R. §§ 419.201-72(a), 419.202-71(a) (1994)</p>	<p>The Department of Agriculture small disadvantaged business regulations state that "[t]he Department is required...to establish fiscal year goals for the procurement preference programs" and mandate establishing aggressive minority and women-owned business goals based on the annual review of advance acquisition plans."</p>
<p>48 C.F.R. § 422.804-2 (1994)</p>	<p>Affirmative action program provision relating to the Department of Agriculture which states that "each contracting office awarding nonexempt construction contracts maintains a current listing of covered geographical areas subject to affirmative action requirements specifying goals for minorities and women in covered construction."</p>
<p>48 C.F.R. § 452.215-71 (1994)</p>	<p>Department of Agriculture instructions for the preparation of technical and cost or pricing proposals state that the contract offeror "[i]ndicate what positive efforts your company will take to implement the concepts of equal employment under the proposed contract" and state the extent of minority enterprise participation "goals the contractor has set in the past five (5) years and his actual performance against these goals."</p>

## Banking

Statute/Reg./Exec. Order #	Summary
12 U.S.C.S. § 1441a(r-w)	Provides for various incentives, including "preference points" on proposals and minority capital assistance programs, to preserve and expand bank ownership by minorities and women; authorizes establishment of Resolution Trust Corporation guidelines to achieve parity in distribution of RTC contracts, and "reasonable goals" for subcontracting, to minority and women-owned businesses and firms; and provides a "[m]inority preference in acquisition of institutions in predominantly minority neighborhoods."
12 U.S.C.S. § 1823(f)(12)	Authorizes Federal Deposit Insurance Corporation (FDIC) approval of minority-controlled bank acquisitions by minority-controlled holding companies without regard to asset size.
12 U.S.C.S. § 2219c	Requires that "all institutions of the Farm Credit System with more than 20 employees shall establish and maintain an affirmative action program plan that applies the affirmative action standards otherwise applied to contractors of the Federal Government."
12 U.S.C.S. § 2907	Any donation or sale on favorable terms of bank branch in minority neighborhood to minority or women-owned depository institution shall be a factor in determining the seller or donor institution's compliance with the Community Reinvestment Act.
12 C.F.R. § 4.63 (1994)	Establishes Contracting Outreach Program for the Office of Comptroller of the Currency to "ensure that minority and women-owned businesses have the opportunity to participate, to the maximum extent possible, in contracts awarded by the OCC." "Minority means any African American, Native American..., Hispanic American, Asian-Pacific American, or Subcontinent-Asian American."
12 C.F.R. Part 361, §§ 361.2, 361.10 (1994)	Federal Deposit Insurance Corporation "Minority and Women Outreach Program" states "policy of the FDIC that minorities and women and entities owned by minorities and women shall have maximum practicable opportunity to participate in [FDIC] contracts" and requires prime contractors "to carry out the FDIC minority and women-owned business contracting policy in the awarding of subcontracts to the fullest extent, consistent with the efficient performance of the awarded contract." For this purpose "minority" means "any Black American, Native American Indian, Hispanic American, or Asian American."
12 C.F.R. §§ 517.5, 517.7 (1994)	The Minority, Women, and Individuals with Disabilities Outreach Program of the Office of Thrift Supervision (OTS) defines "[o]utreach activities" to include "identification and registration of minority-, women-owned (small and large) businesses" and "[m]onitoring proposed purchases to assure that OTS contracting staff understand and actively promote the outreach program." Contract award guidelines state that "[t]he OTS Outreach Program Advocate shall work to facilitate the maximum participation of minority and women-owned...businesses...in the OTS procurement of goods and services."

12 C.F.R. Part 1507 (1994)	Minority and Women Contracting Outreach Program of the Thrift Depositor Protection Oversight Board requires the Board's staff to formulate guidelines providing opportunities, "to the maximum extent possible, for the inclusion of minorities and women," and entities owned by them, in the performance of Board contracts; to undertake specified outreach activities; and to report periodically on minority and women-owned business participation in the contracting process, and as subcontractors on Board contracts. "Minority" means "Black American, Native American, Hispanic American, or Asian American."
12 C.F.R. Part 1617 (1994)	Minority and Women Outreach and Contracting Program of the Resolution Trust Corporation (RTC) describes a variety of outreach activities (§ 1617.11); provides procedures for certification of minority and women-owned businesses (§ 1617.13); provides incentives" and "bonus considerations" to RTC prime contractors "who demonstrate a commitment to subcontract at least 25 percent or more of the work" to minority or women-owned firms (§ 1617.30); and "reserves the right to award a contract directly to a MWOB either by technical competition or by con-competitive award." "Technical and cost bonus points" may be awarded to contractors with an "eligible subcontracting plan" for women and minorities (§ 1617.60). A special outreach program is provided to promote participation of minority and women-owned law firms in RTC legal services contracting (§ 1617.90).
13 C.F.R. §§ 317.19(b), 317.35 (1994)	"No grant shall be made...for any project" under the Local Public Works Capital Development and Investment Program "unless at least 10 percent of the amount of such grant will be expended for contracts with and/or supplies from minority business enterprises." All applications for assistance must contain certification to that effect. "Minority group member means a citizen of the United States who is Negro, Spanish-speaking, Oriental, Indian, Eskimo, or Aleut." (13 C.F.R. 317.2)

## Commerce

Statute/Reg./Exec. Order #	Summary
Executive Order 11625 (1971)	Directs the Secretary of Commerce "[w]ith the participation of other Federal departments and agencies...[t]o develop comprehensive plans and specific program goals for the minority enterprise program; establish regular performance monitoring and reporting systems to assure that goals are being achieved; and evaluate the impact of Federal support in achieving the objectives established by the order." See also Executive Order 12138 (Women-owned Business Enterprise Program).
15 C.F.R. § 24.21(h) (1994)	Grantees and subgrantees of certain grants and cooperative agreements to state and local government "are encouraged to use minority banks (a bank which is owned at least 50 percent by minority group members)."
15 C.F.R. § 917.11(d) (1994)	A "factor" considered in the approval of proposals under the Sea Grant Matched Funding Program "will be the potential of the proposed program to stimulate interest in marine related careers among those individuals, for example, minorities, women, and the handicapped whose previous background or training might not have generated such an interest."
15 C.F.R. § 2301.3 (1994)	The National Telecommunications and Information Administration of the Department of Commerce, in administering the Public Telecommunications Facilities Program, "will give special consideration to applications that foster ownership and control of, operation of, and participation in public telecommunication entities by minorities and women."
48 C.F.R. § 1319.7003(a) (1994)	Directs contracting officers of the Commerce Department to "provide assistance to prime contractors to identify potential women-owned small businesses. Such assistance is intended to aid prime contractors in placing a fair proportion of subcontracts with women-owned businesses."

## Communications

Statute/Reg./Exec. Order #	Summary
47 U.S.C.S. § 309(j)(4)(D)	In radio licensing proceedings, the Federal Communications Commission is directed to prescribe regulations to "ensure that small businesses, rural telephone companies, and businesses owned by members of minority groups and women are given the opportunity to participate in the provision of spectrum-based services, and, for such purposes, consider the use of tax certificates, bidding preferences, and other procedures."
47 C.F.R. § 73.3555(d)(2)(ii) (1994)	Federal Communication Commission (FCC) multiple ownership rules provide exemption for "minority-controlled" broadcast facilities from certain restrictions on the granting or transfer of commercial TV broadcast stations which result in an aggregate national audience exceeding twenty-five percent. " <i>Minority</i> means Black, Hispanic, American Indian, Alaska Native, Asian and Pacific Islander." ( <i>italics</i> in original).
47 C.F.R § 76.977(a),(b),(e) (1994)	Minority and educational programming used in lieu of deregulated commercial leased access capacity. "A cable operator required by this section to designate channel capacity for commercial use pursuant to 47 U.S.C. 532 may use any such channel capacity for the provision of programming from a qualified minority programming source...whether or not such source is affiliated with cable operator." "Qualified minority programming source" means a source "that devotes substantially all of its programming to coverage of minority viewpoints, or to programming directed at members of minority groups, and which is over 50 percent minority-owned." "Minority" includes "Blacks, Hispanics, American Indians, Alaskan Natives, Asians, and Pacific Islanders."
68 F.C.C. 2d 381, 411-412 (1978)	FCC policy awards a quality enhancement credit for minority ownership and participation in station management in the comparative licensing process. When faced with mutually exclusive applications for the same broadcast channel, the FCC initiates a proceeding to compare the merits of the competing applicants based on specific factors including: diversification of control of mass media communications, full time participation in station management by owners, proposed program service, past broadcast record, efficient use of frequency, and character of the applicant. Under the FCC's preference policy, ownership and active participation in station management by members of a minority group are considered a plus to be weighed in with the other comparative factors.
68 F.C.C. 2d 983 (1978)	FCC "Distress Sale" Policy. Under this policy, existing licensees in jeopardy of having their licenses revoked or whose licenses have been designated for a renewal hearing are given the option of selling the license to a minority-owned or controlled firm for up to seventy-five percent of fair market value. The minority-assignee must meet the basic qualifications necessary to hold a license under FCC regulations and must be approved by the FCC before the transfer is consummated.

## Defense

Statute/Reg./Exec. Order #	Summary
10 U.S.C.S. § 2196(j)(8)	Selection criteria for manufacturing engineering grant program established by the Secretary of Defense require proposal by applicant "to achieve a significant level of participation by women, members of minority groups, and individuals with disabilities through active recruitment of students from among such persons."
10 U.S.C.S. § 2323	Establishes a goal of awarding five percent of the total value of Department of Defense procurement, research and development, military construction, and operation and maintenance contracts to "socially and economically disadvantaged individuals," historically black colleges and universities, and minority institutions in each of the fiscal years from 1987 to 2000. This requirement was extended to contracting activities of the Coast Guard and the National Aeronautics and Space Administration by § 7105 of the Federal Acquisition Act of 1994, P.L. 103-355, 108 Stat. 3243, 3369 (1994) which also added a requirement that "[t]o the extent practicable," the head of each of these agencies is to "maximize the number of minority small business concerns, historically Black colleges and universities, and minority institutions participating in the program."
P.L. 103-335, 108 Stat. 2259, 2652, § 8127(a) (1994)	"In entering into contracts with private entities to carry out environmental restoration and remediation of Kaho'olaw Island, Hawaii, and the waters surrounding that island, the Secretary of Navy shall, to the maximum extent practicable, give a preference to small business concerns and small disadvantaged business concerns located in the State of Hawaii. In giving the preference, the Secretary shall give special preference to businesses owned by Native Hawaiians."
32 C.F.R. § 33.21 (h) (1994)	Department of Defense (DOD) Uniform Administrative Requirements for Grants and Cooperative Agreements to State and Local Governments "encourage" DOD grantees and subgrantees to use minority banks at least 50 percent owned by minority group members.
48 C.F.R. § 205.207(d)(iv) (1994)	States that "[f]avor acquisition being considered for historically black college and university and minority institution set-aside," the proposed contract" is being considered as a 100 percent set-aside for historically black colleges and universities (HBCUs) and minority institutions (MIs), as defined by the clause at § 252.226-7000 of the Defense Acquisition Regulation Supplement."

<p>48 C.F.R. Part 219, § 219.000 (1994)</p>	<p>DOD regulation which implements "goal" in 10 U.S.C. 2323 to "[a]ward five percent of contract and subcontract dollars to small disadvantaged business (SDB) concerns, historically black colleges and universities (HBCUs), and minority institutions (MIs)." Specific requirements include data collection and reporting (§ 219.202-5); eligibility requirements include data collection and reporting (§ 219.703); subcontracting plan goals for SDB concerns and institutions (§ 219.704); reviewing the subcontracting plan (§ 219.705-4); solicitation provisions and contract clauses (§ 219.708); and evaluation preference for small disadvantaged business concerns ("by adding a factor of ten percent to the price of all offers") (§ 219.7002). See also 48 C.F.R. § 226.7000 (implements the historically black college and university and minority institution provisions of 10 U.S.C. § 2323; § 252.219-7005) (small business and small disadvantaged business subcontracting plan on DOD contracts); § 252.219.7005 (incentive for subcontracting with small businesses, small disadvantaged businesses, historically black colleges and universities, and minority institutions); § 252.219-7006 (notice of evaluation preference for small disadvantaged business concerns); and § 252.226-7000 (notice of historically black college or university and minority institution set-aside).</p>
<p>48 C.F.R. Chapter 2 APPENDIX I (1994)</p>	<p>Pilot Mentor-Protege Program is to "provide incentives to major DOD contractors, performing under at least one active approved subcontracting plan negotiated with DOD or other Federal agencies, to assist small disadvantaged businesses (SDBs) in enhancing their capabilities to satisfy DoD and other contract and subcontract requirements."</p>

## Education

Statute/Reg./Exec. Order #	Summary
20 U.S.C.S. § 1047	Authorizes grants and contracts by the Department of Education (ED) with "historically black colleges and universit[ies]" and other institutions of higher education servicing a "high percentage of minority students" for the purpose of strengthening their library and information science programs, and establishing fellowships and traineeships for that purpose.
20 U.S.C.S. § 1063b	Authorizes ED grants to specified postgraduate institutions "determined by the Secretary [of Education] to be making substantial contributions to the legal, medical, dental, veterinary, or other graduate education opportunities for Black Americans."
20 U.S.C.S. § 1069f(c)	Reservation of 25 percent of the excess of certain educational appropriations for allocation "among eligible institutions at which at least 60 percent of the students are African Americans, Hispanic Americans, Native Americans, Asian Americans, Native Americans, Native Hawaiians, or Pacific Islanders, or any combination thereof."
20 U.S.C.S. § 1070a-41	"Priority" in selection for Model Program Community Partnership and Counseling Grants given to program proposals "directed at areas which have a high proportion of minority, limited English proficiency, economically disadvantaged, disabled, nontraditional, or at-risk students..."
20 U.S.C.S. § 1112d(d)	"Special consideration" to be given "historically Black colleges and universities" and to institutions having at least 50 percent minority enrollment in making grants for teacher training and placement.
20 U.S.C.S. § 1132b-2	In awarding facilities improvement grants, the ED Secretary or each State higher education agency "shall give priority to institutions of higher education that serve large numbers or percentages of minority or disadvantaged students."
20 U.S.C.S. § 1134c	In making grants for post-graduate study, the ED Secretary shall "consider the need to prepare a larger number of women and individuals from minority groups, especially from among such groups which have been traditionally underrepresented in professional and academic careers," and shall accord a "priority" for awards to "individuals from minority groups and women" pursuing study in specified professional and career fields.
20 U.S.C.S. § 1134e	The ED Secretary "shall carry out a program to assist minority, low-income, or educationally disadvantaged college students' to pursue a degree and career in law through an annual grant or contract.
20 U.S.C.S. §§ 1135c, 1135d	The ED Secretary shall "carry out a program of making grants to institutions of higher education that are designed to provide and improve support programs for minority students enrolled in science and engineering programs as institutions with a significant minority enrollment (at least 10 percent)." Eligibility for such grants is limited to "minority institutions" (minority enrollment in excess of 50 percent) or other public or private nonprofit institutions with at least 10 percent minority enrollment.

20 U.S.C.S. § 1409(j)(2)	The ED Secretary "shall develop a plan for providing outreach services" to historically Black colleges and universities, other higher educational institutions with at least 25 percent minority student enrollment, and "underrepresented populations" in order to "increase the participation of such entities" in competitions for certain grants, contracts, and cooperative agreements.
20 U.S.C.S. § 1431(a)(3)	"Priority consideration" for fellowships and traineeships in special education and related services shall be given to "individuals from disadvantaged backgrounds, including minority and individuals with disabilities who are underrepresented in the teaching profession or in the specialization in which they are being trained."
20 U.S.C.S. § 2986(b)	A portion of state allotment of critical skills improvement funds to be distributed for various purposes, including "recruitment or retraining of minority teachers to become mathematics and science teachers."
20 U.S.C.S. § 3156(a)	Program to assist local educational agencies "which have significant percentages of minority students" to conduct "alternative curriculum" schools which "reflect a minority composition of at least 50 percent" and contribute to school desegregation efforts.
20 U.S.C.S. § 3916	Fifteen percent of National Science Foundation funds available for science and engineering education is to be allocated to faculty exchange and other programs involving higher educational institutions with "an enrollment which includes a substantial percentage of students who are members of a minority group."
20 U.S.C.S. § 5205(d)	No less than 10 percent of Eisenhower Exchange Fellowship Program funds "shall be available only for participation by individuals who are representative of United States minority populations."
20 U.S.C.S. § 6031(c)(5)	ED "shall establish and maintain initiatives and programs to increase the participation" of "researchers who are women, African-American, Hispanic, American Indian and Alaskan Native, or other ethnic minorities" in the activities of various authorized educational institutes.
42 U.S.C.S. § 292g(d)(3)	For a three-year period beginning on October 13, 1992, historically black colleges and universities are exempted from provision rendering certain institutions ineligible for student loan program based on high loan default rate.
42 U.S.C.S. § 293a	"Special consideration" in scholarship grant program to be given "health profession schools that have enrollments of underrepresented minorities above the national average for health profession schools."
42 U.S.C.S. § 293b(3)	Institutional eligibility for faculty fellowship program based on "ability to...identify, recruit and select individuals from underrepresented minorities in the health profession" with potential for teaching and educational administration.
42 U.S.C.S. § 1862d	At least 12 percent of amounts appropriated for the Academic Research Facilities Modernization Program shall be reserved for historically Black colleges and universities and other institutions which enroll a substantial percentage of Black American, Hispanic American, or Native American students.
34 C.F.R. § 74.12 (1994)	Department of Education (ED) Uniform Administrative Requirements for Grants to Institutions of Higher Education, Hospitals, and Nonprofit Organizations "encourage" ED grantees and subgrantees to use minority-owned banks. See also 34 C.F.R. § 80.21(h) (1994).

34 C.F.R. § 318.11(a)(15), (16) (1994)	Includes "[t]raining minorities and individuals with disabilities" and "minority institutions" among several optional funding priorities under special education training program.
34 C.F.R. § 461.33(a)(2)(ii) (1994)	"[P]articular emphasis" placed on training "minority" adult educators under one aspect of adult education demonstration grant program.
34 C.F.R. Part 607, § 607.2(b) (1994)	An institution of higher education is eligible to receive a grant under the Strengthening Institutions Program even if it does not satisfy certain other generally applicable state authorization or accreditation requirements if its student enrollment consists of specified percentages of designated minority groups.
34 C.F.R. Parts 608, 609 (1994)	"The Strengthening Historically Black Colleges and Universities Program [HBCU] provides grants to Historically Black Colleges and Universities to assist these institutions in establishing and strengthening their physical plants, academic resources and student services so that they may continue to participate in fulfilling the goal of equality of educational opportunity." (§ 608.1)
34 C.F.R. § 637.1 (1994)	"The Minority Science Improvement Program is designed to effect long-range improvement in science education at predominantly minority institutions and to increase the flow of underrepresented ethnic minorities, particularly minority women, into scientific careers."
34 C.F.R. § 641.1 (1994)	"The Faculty Development Fellowship Program provides grants to institutions of higher education, consortia of institutions, and consortia of institutions and nonprofit organizations to fund fellowships for individuals from underrepresented minority groups to enter or continue in the higher education professorate."

## Energy

Statute/Reg./Exec. Order #	Summary
42 U.S.C.S. § 7141	The Secretary of Energy "may provide financial assistance in the form of loans to any minority business enterprise under such rules as he shall prescribe to assist such enterprises in participating fully in research, development, demonstration, and contract activities of the Department to the extent he considers appropriate."
42 U.S.C.S. § 13556	Provides that "[t]o the extent practicable, the head of each agency shall provide that the obligation of not less than 10 percent of the total combined amounts obligated for contracts and subcontracts by each agency" under the Energy Policy Act of 1992 "shall be expended with" socially and economically disadvantaged small businesses, historically Black colleges or universities, or college and universities with more than 20 percent Hispanic or Native American enrollment.
P.L. 103-160, 107 Stat. 1547, 1956, § 3159 (1993)	Provides, as a "goal," that 5 percent of the combined total of funds obligated by the Department of Energy for purposes of carrying out national security programs for fiscal years 1994 through 2000 be allocated to contracts and subcontracts with socially and economically disadvantaged small businesses, historically black colleges and universities, and minority institutions.
10 C.F.R. § 600.3 (1994)	"Socially and economically disadvantaged" firm or individual, for purposes of Department of Energy (DOE) financial assistance rules, is defined to include "Black Americans, Hispanic Americans, Native Americans, Asian-Americans Asian-Pacific Americans, and other specified minorities, or any other individual found to be disadvantaged by the Small Business Administration under § 8(a) of the Small Business Act."
10 C.F.R. 799.2, 799.7 (1994)	A requirement of DOE loan guarantee program for waste projects that "the borrower agree to take positive efforts to maximize the utilization of small and disadvantaged business concerns in connection with the project..." For this purpose, "[d]isadvantaged business concern means a concern which is at least 51 percent owned by one or more socially and economically disadvantaged individuals" as defined by the Small Business Act.
10 C.F.R. Part 800, § 800.003 (1994)	Under DOE regulations setting forth policies and procedures for the award and administration of loans to minority small business enterprises, "[a]n individual who is a citizen of the United States and who is a Negro, Puerto Rican, American Indian, Eskimo, Oriental, or Aleut, or is a Spanish speaking individual of Spanish descent, is a member of a 'minority'..."
10 C.F.R. § 1040.101(b)(1),(2) (1994)	Under DOE regulations prohibiting discrimination in federally assisted programs, the agency is to select recipients for compliance reviews based, among other factors, on "[t]he relative disparity between the percentage of minorities, women, or handicapped persons, in the relevant labor market, and the percentage of minorities, women, or handicapped persons, employed by the recipient" or "in the population receiving program benefits."

## Environment

Statute/Reg./Exec. Order #	Summary
P.L. 101-549, 104 Stat. 2399, 2708, § 1001 (1990)	"In providing for any research relating to the requirements of the amendments made by the Clean Air Act Amendments of 1990 which uses funds of the Environmental Protection Agency, the Administrator of the Environmental Protection Agency shall, to the extent practicable, require that not less than 10 percent of total Federal funding for such research will be made available to disadvantaged business concerns," defined to mean any concern with 51 percent of the stock owned by Black Americans, Hispanic Americans, Native Americans, Asian Americans, Women or Disabled Americans.
40 C.F.R. § 33.240 (1994)	Environmental Protection Agency (EPA) procurement requirements provide that "[i]t is EPA policy to award a fair share of subagreements to small, minority, and women's businesses. The recipient must take affirmative steps to assure that small, minority, and women's businesses are used when possible as sources of supplies, construction, and services."
40 C.F.R. § 35.936-7 (1994)	Grantees of EPA state and local assistance grants "shall make positive efforts to use small business and minority owned business sources of supplies and services. Such efforts should allow these sources the maximum feasible opportunity to compete for subagreements to be performed using Federal grant funds." See also 40 C.F.R. Part 35 APPENDIX C-1 (14) (consulting engineering agreement).
40 C.F.R. § 35.3145(d) (1994)	State Water Pollution Control Revolving Fund requirement "for the participation of minority and women owned businesses (MBE/WBEs) will apply to assistance in an amount equaling the grant. To attain compliance with MBE/WBE requirements, the [regional administrator] will negotiate an overall 'fair share' objective with the state for MBE/WBE participation on these SRF funded activities. A fair share objective should be based on the amount of the capitalization grant award or other State established goals." See also 40 C.F.R. § 35.4066(g) (1994) (grants for technical assistance).
40 C.F.R. § 35.6580 (1994)	Recipients under Cooperative Agreements and Superfund State Contracts for Superfund Response Actions "must comply with six steps...to insure that MBEs, WBEs, and small businesses are used whenever possible as sources of supplies, construction, and services," including establishment of "an annual 'fair share' objective for MBE and WBE use."

### General Services Administration

Statute/Reg./Exec. Order #	Summary
41 C.F.R. §§ 105-71.121(j), 105-72.302(j) (1994)	General Services Administration (GSA) Uniform Administrative Requirements for Grants and Cooperative Agreements to State and Local Governments "encourage recipients to use minority-owned and women owned banks.
41 C.F.R. § 105-72.504(b) (1994)	All recipients of GSA grants and agreements awarded to institutions of higher education, hospitals, and other non-profit organizations are to establish written procurement procedures to provide for "positive efforts...to utilize small businesses, minority-owned businesses, and women's business enterprises, whenever possible" and to ensure that such businesses "are utilized to the fullest extent practicable."
48 C.F.R. § 552.219-9 (1994)	Small business subcontracting plan prescribed for General Service Administration contracts requires "[g]oals, expressed in terms of percentages of total planned subcontracting dollars, for the use of small business concerns, small disadvantaged business concerns and, if an individual contract is involved, women-owned small business concerns as subcontractors."

## Health and Human Services

Statute/Reg./Exec. Order #	Summary
42 U.S.C.S. § 3027	State plans for grant program on aging "shall provide assurances that special efforts will be made to provide technical assistance to minority providers of services."
42 U.S.C.S. § 3035d	Provides that the Assistant HHS Secretary "shall carry out, directly or through grants or contracts, special training programs and technical assistance designed to improve services to minorities" under the Older Americans Act.
42 C.F.R. § 52c.2 (1994)	Minority Biomedical Research Support Program makes grants to higher educational institutions with 50 percent or other "significant proportion" of ethnic minority enrollment.
42 C.F.R. § 62.57(h) (1994)	Among factors considered in making certain State loan repayment grants to State applicants is "[t]he extent to which special consideration will be extended to medically underserved areas with large minority populations."
42 C.F.R. § 64a 105(d)(2) (1994)	"Preferred service" for purposes of obligated service requirement for mental health traineeships includes service in any public or private nonprofit entity serving 50 percent or more specified racial or ethnic minorities.
45 C.F.R. §§ 74.12(h), 92.21(h), 602.21(h) (1994)	Department of Health and Human Services (HHS) general administration requirements "encourage" grantees and subgrantees to use minority banks at least 50 percent owned by minority group members. Similar provisions may be found at 45 C.F.R. §§ 1050.13, 1157.21, 1174.21, 1183.21, and 1234.21.
45 C.F.R. § 1010.30-2(c)(1),(2) (1994)	Civil rights program requirements of Community Service Act grantees provide that the Office of Human Rights will consider when selecting for compliance reviews "[t]he relative disparities between the percentage of eligible minority or female populations, if appropriate, receiving program benefits and the percentage of eligible minorities or females, if appropriate, in the eligible population."
48 C.F.R. § 319.705-4(d)(i)(ii) (1994)	HHS small disadvantaged business subcontracting regulation require contracting officer to insure that "[s]ubcontracting goals for small and small disadvantaged business concerns are specifically set forth in each contract or modification over the statutory thresholds..." See also §§ 319.705-6, 319-706.

## Housing and Urban Development

Statute/Reg./Exec. Order #	Summary
24 C.F.R. § 84.22(j)	All recipients of Department of Housing and Urban Development (HUD) grants and agreements awarded to institutions of higher education, hospitals, and other non-profit organizations "shall be encouraged to use women-owned and minority-owned banks (a bank which is owned at least 50 percent by women or minority group members)." Same provisions apply to use of lump-sum grants under this program, 24 C.F.R. § 84.82(c)(2), a related HUD state and local grant and cooperative agreement program, 24 C.F.R. § 85.21(h) (1994), and comprehensive planning assistance grants at 24 C.F.R. § 600.410(k)(2) (1994).
24 C.F.R. § 84.44(b)	All recipients of HUD grants and agreements awarded to institutions of higher education, hospitals, and other non-profit organizations are to establish written procurement procedures to provide for "positive efforts...to utilize small businesses, minority-owned businesses, and women's business enterprises, whenever possible" and to ensure that such businesses "are utilized to the fullest extent practicable." Some provisions apply to procurement standards used by recipients for the procurement of supplies, equipment, real property and other services with federal funds. 24 C.F.R. § 84.84(e)(2)(j)
24 C.F.R. APPENDIX A and B to SUBTITLE A § 425(a)(8) (1994)	Rating factors award of certain HUD Public and Indian Housing Home Ownership funds to accord maximum 10 points for "[t]he extent to which the applicant demonstrates a firm commitment to promoting the use of minority business enterprises and women-owned businesses, especially resident-owned businesses"... "but may not include awarding contracts solely or in part on the basis of race or gender."
24 F.F.R. § 572.320(e) (1994)	HUD will assign points in rating applications for certain single-family home ownership grants based on "[t]he extent to which the applicant demonstrates a firm commitment to promoting the use of minority business enterprises and women-owned businesses"... "but may not include awarding contracts solely or in part on the basis of race or gender."
24 C.F.R. §§ 850.33(o), .35(b), .399(b)(9) (1994)	Applications for Section 8 Housing Assistance Programs and Section 202 Direct Loan Program must include a "description of minority and women representation in the ownership of the project" and "a minority and women-owned business development plan which shall contain specific and measurable goals and an affirmative strategy to promote awareness and participation of such businesses in the contracting and procurement activities generated by the project." In addition "[m]ore favorable consideration will be given to projects with the higher percentage of minority or women representation in the ownership of the project."
24 C.F.R. § 968.110(b) (1994)	Public housing modernization program requirements include: "the [public housing authority] shall take every action to meet Departmental goals for awarding modernization contracts to minority business enterprises. The PHA shall take appropriate affirmative action to assist women's business enterprises."
24 C.F.R. § 968.320(d)(7)(vii)	Public Housing Modernization program includes requirement of comprehensive plan certifying that "[t]he PHA has adopted the goal of awarding a specified percentage of the dollar value of the total of the modernization contracts, to be awarded during subsequent FFYs, to minority business enterprises and will take appropriate affirmative action to assist resident-controlled and women's business enterprises..."

Continuation HUD	
48 C.F.R. § 2419.901 (1994)	Department of Housing and Urban Development (HUD) Office of Socially Disadvantaged Business Utilization is responsible for "Department-wide goals" for contract awards "to woman-owned businesses" and monitoring and reporting with respect thereto.
48 C.F.R. § 2426.101 (1994)	States the policy of the Department of Housing and Urban Development "to foster and promote Minority Business Enterprise (MBE) participation in its procurement program, to the extent permitted by law and consistent with its primary mission." For this purpose, "minority" is defined as "Black Americans, Hispanic Americans, Native Americans, Asian Pacific Islanders and Asian Indian American, and Hasidic Jewish Americans." <i>See also</i> 48 C.F.R. § 2452.219-70 (Small Business and Small Disadvantaged Business Subcontracting Plan to include percentage goals).

## Interior

Statute/Reg./Exec. Order #	Summary
25 C.F.R. § 276.3(c) (1994)	Uniform administrative requirements for grants by the Bureau of Indian Affairs "encourage" grantees to use minority banks.
43 C.F.R. §§ 12.61(h), 12.922(j) (1994)	Department of Interior Uniform Administrative Requirements for Grants and Cooperative Agreements to State and Local Governments "encourage" grantees and subgrantees to use minority banks at least 50 percent owned by minority group members.
43. C.F.R. § 12.944(b) (1994)	Department of Interior procurement requirements provide that "[i]t is EPA policy to award a fair share of subagreements to small, minority, and women's businesses. The recipient must take affirmative steps to assure that small, minority, and women's businesses are used when possible as sources of supplies, construction, and services."
43 C.F.R. § 27.6 (1994)	Affirmative action plan requirements for recipient of financial assistance from the Department of Interior include "specific goals and specific timetables to which its efforts will be directed, to correct all deficiencies and thus to increase materially the participation of minorities and women in all aspects of its operation."
48 C.F.R. § 1419.901 (1994)	Department of Interior socioeconomic program regulations state that "[a]nnual goals for contract awards to women-owned businesses shall be established as prescribed in 1419.202-70."

## Justice

Statute/Reg./Exec. Order #	Summary
P.L. 103-322, 108 Stat. 1796, 1860, § 31001 (1994)	Not less than 10 percent of the amount paid from the Local Government Fiscal Assistance Fund created by the Violent Crime Control Act shall be expended on contracts or subcontracts with socially and economically disadvantaged and women-owned small businesses, historically Black colleges and universities, and higher educational institutions with more than 40 percent Hispanic student enrollment.
28 C.F.R. § 0.18a (1994)	Provides that Director of the Office of Small and Disadvantaged Business Utilization within the Department of Justice shall "[e]stablish Department goals for the participation by small businesses, including small businesses owned and controlled by socially and economically disadvantaged individuals, in Department procurement contracts."
28 C.F.R. § 42.206(c)(1) (1994)	Recipients of Criminal Justice Improvement Act funds shall be selected for post-award compliance reviews in part on the basis of "[t]he relative disparity between the percentage of minorities, or women, in the relevant labor market, and the percentage of minorities, or women, employed by the recipient."
28 C.F.R. § 66.21(h) (1994)	Uniform requirements by the Justice Department for administration of state and local grants and cooperative agreements "encourage" grantees and subgrantees to use minority banks at least 50 percent owned by minority groups.

## Labor

Statute/Reg./Exec. Order #	Summary
29 U.S.C.S. § 718b(b)	Directs the Commissioner of the Rehabilitation Services Administration to develop an "outreach" policy for "recruitment of minorities into the field of vocational rehabilitation, counseling and related disciplines" and for "financially assisting Historically Black Colleges and Universities, Hispanic-serving institutions of higher education, and other institutions of higher education whose minority enrollment is at least 50 percent."
29 U.S.C.S. § 771a	Authorizes grants for personnel projects relating to training, traineeships and related activities to historically Black colleges and universities and other higher educational institutions with at least 50 percent minority student enrollment.
20 C.F.R. § 627.430(g) (1994)	Recipients and subrecipients of Job Training Partnership Act funds are "encouraged to use minority-owned banks (a bank which is owned at least 50 percent by minority group members)."
20 C.F.R. § 653.111(a),(b)(3) (1994)	State agencies participating in the administration of Services for Migrant and Seasonal Farmworkers, under the United States Employment Service, are to develop affirmative action plans which contain "a comparison between the characteristics of the staff and the workforce and determine if the composition of the local office staff(s) is representative of the racial and ethnic characteristics of the workforce in the local office service area(s)." "On a statewide basis, staff representative of the racial and ethnic characteristics in the workforce shall be distributed in substantially the same proportion among (1) all job groups'...and (2) all offices in the plan(s)."
29 C.F.R. §§ 89.52(d), 89.72(d), 95.22(j), 97.21(h), 1470.21(h) (1994)	Administrative requirements for Department of Labor (DOL) Project Grants to State and Local Governments, higher educational institutions, and other programs, "encourage" grantees to use minority banks.
29 C.F.R. § 95.44(b) (1994)	All recipients of DOL grants and agreements awarded to institutions of higher education, hospitals, and other non-profit organizations are to establish written procurement procedures to provide for "positive efforts...to utilize small businesses, minority-owned businesses, and women's business enterprises, whenever possible" and to ensure that such businesses "are utilized to the fullest extent practicable."
48 C.F.R. Part 2919, § 1919.202-70 (1994)	Small disadvantaged business program regulations of the Department of Labor require "heads of Contracting Activities [to] develop annual goals for each category of small business and small disadvantaged business utilization programs, which shall include projected acquisition awards to small businesses, minority businesses, 8(a) concerns, women-owned businesses, and HBCU."

## National Aeronautics and Space Administration

Statute/Reg./Exec. Order #	Summary
42 U.S.C.S § 2473b	NASA Administrator is required to annually establish a goal of at least eight percent of the total value of prime and subcontracts awarded in support of authorized programs to be made to small disadvantaged businesses and minority educational institutions.
48 C.F.R. § 1819.705-4 (1994)	Small disadvantaged business subcontracting regulation of the National Aeronautics and Space Administration (NASA) states that "NASA contracting officers may accept as an element of a subcontracting plan the prime contractor's intention to use total small business, small disadvantaged business, women-owned business, historically black college and university, or minority educational institution set-asides in awarding subcontracts so long as such set-asides are competitive and awards are made at reasonable prices." See also § 1819.7003 (agency goal of 8 percent of total value of prime and subcontracts for disadvantaged businesses); and § 1815.219-76 (prescribed clause for NASA contracts incorporating 8 percent goal for "small business concerns or other organizations owned or controlled by socially and economically disadvantaged individuals (including women), Historically Black Colleges and Universities, and minority educational institutions").

### Small Businesses

Statute/Reg./Exec. Order #	Summary
41 U.S.C.S § 417a	"Each Federal agency shall report to the Office of Federal Procurement Policy the number of small businesses owned and controlled by women and the number of small business concerns owned and controlled by socially and economically disadvantaged businesses, by gender, that are first time recipients of contracts from such agency."
13 C.F.R. § 115.30(c) (1994)	The Small Business Administration (SBA) Surety Bond Guarantee program indemnifies sureties for 90 percent of losses incurred on certain bonds "issued on behalf of a small concern owned and controlled by socially and economically disadvantaged individuals," including "Black Americans, Hispanic Americans, Native Americans, Asian Pacific Americans, Subcontinent Asian Americans, and other minorities or any other individual found to be disadvantaged by SBA..."
13 C.F.R. § 125.4 (1994)	Small Business Administration requirement "[t]hat separate goals for the participation by small business concerns and small disadvantaged business in Government procurement contracts and subcontracts thereunder shall be established annually by the head of each Federal agency following consultation with the SBA, and that the Administrator of the Office of Federal Procurement Policy shall establish the goal whenever there is disagreement between a Federal agency head and the SBA..."
13 C.F.R. § 143.21(h) (1994)	Grantees and subgrantees under SBA program of grants and cooperative agreements with state and local governments are "encouraged to use minority banks (a bank which is owned at least 50 percent by minority group members)."

## State Department and Foreign Affairs

Statute/Reg./Exec. Order #	Summary
22 U.S.C.S. § 4852(d)	Not less than 10 percent of the amount appropriated for diplomatic construction or designed projects each fiscal year shall be allocated to the extent practicable for contracts with American minority contractors.
22 U.S.C.S. § 4864(e)	Not less than 10 percent of the amount of funds obligated for local guard contracts for Foreign Service buildings shall be allocated to the extent practicable for contracts with minority small business contractors.
P.L. 103-306, 108 Stat. 1608, § 555 (1994)	Provides for a 10 percent set-aside of the aggregate amount of certain appropriations to the Agency for International Development--the Development Assistance Fund, Population, Development Assistance, and the Development Fund for Africa--for socially and economically disadvantaged U.S. businesses and private voluntary organizations, historically black colleges and universities, and higher educational institutions with more than 40 percent Hispanic student enrollment.
Government procurement agreements	The United States has entered into procurement obligations under the North American Free Trade Agreement (NAFTA) (Chapter Ten) and the Uruguay Round Agreement on Government Procurement under which the United States agrees, among other things, to accord national treatment to products, services, and suppliers of other parties with respect to government contracts entered into by named agencies above certain threshold amounts. In both the NAFTA and the Uruguay Round Agreement (as well as in earlier trade agreements), the United States has taken a reservation stating that agreement obligations will not apply to set asides on behalf of small and minority businesses (NAFTA, Chapter 10, Annex 1001.2b, General Notes, Schedule of the United States, Note 1; Uruguay Round Agreement on Government Procurement, Annex of the United States, General Note 1).
22 C.F.R. § 145.44(b) (1994)	All recipients of Department of State grants and cooperative agreements awarded to institutions of higher education and other non-profit organizations are to establish written procurement procedures to provide for "positive efforts...to utilize small businesses, minority-owned businesses, and women's business enterprises, whenever possible" and to ensure that such businesses "are utilized to the fullest extent practicable." Same provisions apply pursuant to uniform administrative requirements prescribed by 22 C.F.R. 518.44(b) (1994).
48 C.F.R. § 652.219-70 (1994)	Clause in Department of State contracts requiring disadvantaged and minority subcontracting goals. <i>See also</i> 48 C.F.R. §§ 619.201(b), 619.708-70
48 C.F.R. § 706.302-71 (1994)	Agency for International Development (AID) requirement that "[e]xcept to the extent otherwise determined by the Administrator, not less than ten percent of amounts made available for development assistance and for assistance for famine recovery and development in Africa shall be used only for activities of disadvantaged enterprises," which includes minorities and women.

Continuation State Dept of Foreign Affair	
48 C.F.R. Part 419 (1994)	Socioeconomic Program policies of AID state that "[w]here practicable and desirable, small business and minority goals will be established" for procuring activities (§ 719.270(e)); and mandates that the AID Office of Small Disadvantaged Business develop "a plan of operation designed to increase the share of contracts awarded to small business concerns, including small minority business enterprises" (§ 719.271-2(6)). Disadvantaged enterprises include socially and economically disadvantaged concern, historically black colleges and universities, and higher educational institutions with more than 40 percent Hispanic student enrollments (§§ 726.201, 752.226-1,2).

## Transportation

Statute/Reg./Exec. Order #	Summary
49 U.S.C.S. § 47107(e)(1)	Requires federally aided airport operators to insure "to the maximum extent practicable" that at least 10 percent of contracts for consumer services to the public be placed with "small business concerns owned and controlled by a socially and economically disadvantaged individual..." The statute incorporates the Small Business Act definition of that term "except that women are presumed to be socially and economically disadvantaged." (49 U.S.C.A. § 47113(a)(2)).
P.L. 102-240, 105 Stat. 1914, 1919, § 1003(b) (1991)	"Except to the extent that the Secretary [of Transportation] determines otherwise, not less than 10 percent of the amounts authorized to be appropriated" under various Titles of the Intermodal Surface Transportation Act of 1991 "shall be expanded with disadvantaged individuals;" the statute incorporates the SBA presumption in favor of racial minorities (15 C.F.R. § 637(d) and further provides that "women shall be presumed to be socially and economically disadvantaged individuals for purposes of this subsection."
49 C.F.R. Part 23, subpart C (1994)	Minority-business enterprise program requirements for recipients and applicants under Department of Transportation financial assistance programs. DOT approved MBE affirmative action programs are to include recipient's "overall goals and a description of the methodology to be used in establishing them" (§ 23.43) and separate "contract goals for firms owned and controlled by minorities and firms owned and controlled by women respectively" (§ 23.45). Rules for counting MBE participation toward meeting applicable goals (§ 23.47). The regulations further provide that a prime contractor unable to satisfy a particular contract's minority goal may nevertheless be awarded the contract if its "best efforts" were made to achieve the goal (§§ 23.45(g)(2)(ii), 23.45(h)). Several elements are considered in determining whether a prime contractor failing to meet its goal in fact made a good faith effort to comply (§ 23.45, app. A).
49 C.F.R Part 23, subpart D (1994)	Implementation of § 105(f) of the Surface Transportation Assistance Act of 1982. DOT regulations establish a rebuttable presumption that women, Black-Americans, Hispanics, Native Americans, Asian-Pacific Americans, Asian-Americans and those individually certified under § 8(a) of the Small Business Act are socially and economically disadvantaged (§ 23.62). Recipients of surface transportation funds must establish overall goal for disadvantaged business participation on funded projects (§ 23.64) and, absent a waiver by the DOT Secretary, must insure that at least ten percent of monies expended on federally assisted projects go to such enterprises (§§ 23.61(a), 23.63). "If a recipient fails to meet an approval goal, it shall have the opportunity to explain to the Administrator of the concerned Department element why the goal could not be achieved and why meeting the goal was beyond the recipient's control," failing which the recipient is subject to "appropriate remedial sanction" (§ 23.68).
49 C.F.R. § 23.95 <i>et seq.</i> (1994)	Minority business enterprise participation standards under § 511(A)(17) of the Airport and Airway Improvement Act of 1982 provide that sponsors of airport improvement projects "shall establish an overall goal for the participation of DBE's" as concessionaires and "[t]o the extent practicable, shall seek to obtain DBE participation in all types of concession activities." "Where not prohibited by state or local law and determined...to be necessary to meet DBE goals, procedures to implement DBE set-asides shall be established. The DBE plan shall specify the concessions to be set-aside."

Continuation Transportation	
49 C.F.R. § 265.13 (1994)	Federal Railroad Administration regulations barring discrimination in federally assisted programs require "where there are deficiencies based on past practices, and with respect to future plans for hiring and promoting employees or awarding contracts, the development of specific goals and timetables for the prompt achievement and maintenance of full opportunities for minority persons and MBEs with respect to programs, projects and activities subject to this subpart.

### Veterans Affairs

Statute/Reg./Exec. Order #	Summary
38 C.F.R. § 43.21(h) (1994)	Department of Veterans Affairs Uniform Administrative Requirements for Grants and Cooperative Agreements to State and Local Governments "encourage" grantees and subgrantees to use minority banks at least 50 percent owned by minority group members.
48 C.F.R. § 819.202-5(c) (1994)	Department of Veterans Affairs regulations require "all acquisition activities [to] submit information and procurement preference goals" for minority direct business awards," "women-owned business awards," and "[s]ubcontracts to be awarded to small disadvantaged business concerns."

### Other

Statute/Reg./Exec. Order #	Summary
36 C.F.R. Part 906 (1994)	Affirmative action policy and procedures, including goals and timetables for women and minorities, "to assure full minority participation in activities and benefits that result from implementation of the Pennsylvania Avenue Plan-1974."
36 C.F.R. § 1207.21(h) (1994)	National Archives and Records Administration Uniform Administrative Requirements for Grants and Cooperative Agreements to State and Local Governments "encourage" grantees and subgrantees to use minority banks at least 50 percent owned by minority group members.
44 C.F.R. §§ 13.21(h) (1994)	Federal Emergency Management Agency Uniform Administration Requirements for Grants and Cooperative Agreements to State and Local Governments "encourage" grantees and subgrantees to use minority banks at least 50 percent owned by minority group members.

## EQUAL EMPLOYMENT OPPORTUNITY LAWS

The evolution of federal law and policy regarding affirmative action in employment may be traced to a series of executive orders dating to the 1960's which prohibit discrimination and require affirmative action by contractors with the federal government. The Office of Federal Contract Compliance Programs, an arm of the U.S. Department of Labor, currently enforces the E.O. 11246, as amended, by means of a regulatory program requiring larger federal contractors, those with procurement or construction contracts in excess of \$50,000, to make a "good faith effort" to attain "goals and timetables" to remedy underutilization of minorities and women. Another early Executive Order, No. 11478, was a precursor to the 1964 Civil Rights Act and mandates affirmative action hiring and employment policies by all federal executive department and agencies.

Public and private employers with 15 or more employees are also subject to a comprehensive code of equal employment opportunity regulation under Title VII of the 1964 Civil Rights Act." Except as may be imposed by court order to remedy "egregious" violations of the law, or by consent decree to settle pending claims, however, there is no general statutory obligation on employers to adopt affirmative action measures. But the EEOC has issued guidelines to protect employers and union from charges of "reverse discrimination" when they voluntarily take action to correct the effects of past discrimination. Federal departments and agencies, by contrast, are required to periodically formulate affirmative action plans for their employees and a "minority recruitment program" to eliminate minority "underrepresentation" in specific federal job categories.

Section 717 of 1972 Amendments to Title VII of the 1964 Civil Rights Act empowers the Equal Employment Opportunity Commission to enforce nondiscrimination policy in federal employment by "necessary and appropriate" rules, regulations, and orders and through "appropriate remedies, including reinstatement or hiring of employees, with or without backpay." Each federal department and agency, in turn, is required to prepare annually a "national and regional equal employment opportunity plan" for submission to the EEOC as part of "an affirmative program of equal employment opportunity for all...employees and applicants for employment." 29 C.F.R. Part 1608 (the guidelines state the EEOC's position that when employers voluntarily undertake in good faith to remedy past discrimination by race- or gender-conscious affirmative action means, the agency will not find them liable for reverse discrimination).

Section 717 was reinforced in 1978 when Congress enacted major federal civil service reforms including a mandate for immediate development of a "minority recruitment program" designed to eliminate "underrepresentation" of minority groups in specific federal job categories. The EEOC and Office of Personnel Management have issued rules to guide implementation and monitoring of minority recruitment programs by individual federal agencies. Among various other specified requirements, each agency plan "must include annual specific determinations of underrepresentation for each group and must be accompanied by quantifiable indices by which progress toward eliminating underrepresentation can be measured."

In addition, the following statutes and regulations relate to employment policies of the federal government or under federal grant and assistance programs:

**Federal Government/Federal Grant and Assistance Programs  
Employment Policies**

Statute/Reg./Exec. Order #	Summary
5 U.S.C.S. § 4313(5)	Performance appraisal in the Senior Executive Services to take account of individuals' "meeting affirmative action goals, achievement of equal employment opportunity requirements, and compliance with merit principles..."
5 U.S.C.S. § 7201	Establishes a "Minority Recruitment Program" for the Executive Branch and directs each Executive agency, "to the maximum extent possible," to "conduct a continuing program for the recruitment of members of minorities for positions in the agency...in a manner designed to eliminate underrepresentation of minorities in the various categories of civil service employment within the Federal service, with special efforts directed at recruiting in minority communities, in educational institutions, and from other sources from which minorities can be recruited."
22 U.S.C.S § 4141(b)	Establishes the Foreign Service Internship Program "to promote the Foreign Service as a viable and rewarding career opportunity for qualified individuals who reflect the cultural and ethnic diversity of the United States..."
29 U.S.C.S. § 1781(a)	"A contractor subject to the affirmative action obligations of Executive Order 11246...may establish or participate in training programs pursuant to this section...which are designed to assist such contractors in meeting the affirmative action obligations of such Executive Order."
42 U.S.C.S. § 282(h)	The Secretary of HHS, and the National Institutes of Health, "shall, in conducting and supporting programs for research, research training, recruitment, and other activities, provide for an increase in the number of women and individuals from disadvantaged backgrounds (including racial and ethnic minorities) in the fields of biomedical and behavioral research."
45 U.S.C.S §§ 797b, 907, 1004	First right to hire of certain previously separated or furloughed railroad employees subject to exceptions for vacancies covered by "(1) an affirmative action plan, or a hiring plan designed to eliminate discrimination, that is required by Federal or State statute, regulation, or Executive order, or by the order of a Federal court or agency, or (2) a permissible voluntary affirmative action plan."
Executive Order 11246	Prohibits employment discrimination because of race, color, religion, sex, or national origin by nonexempt federal government contractors and requires inclusion of an affirmative action clause in all covered federal contracts for procurement of goods and services. Pursuant to Labor Department regulations, larger federal contractors are required to adopt goals and timetables to correct "underutilization" of minorities and women. See 41 C.F.R. Part 60 (discussed <i>infra</i> ).
Executive Order 11478	States the policy of the United States government "to provide equal opportunity in Federal employment for all persons, to prohibit discrimination because of race, color, religion, sex, national origin, handicap, or age, and to promote the full realization of equal employment opportunity through a continuing affirmative program in each executive agency and department."

## Federal Regulations

Statute/Reg./Exec. Order #	Summary
5 C.F.R. Parts 729, 720 APP. (1994)	Affirmative Employment Programs of the Office of Personnel Management and Guidelines for Development of A "Minority Recruitment Program" to Implement 5 U.S.C. § 7201.
14 C.F.R. § 152.407, .409, .411 (1994)	All grantees, sponsors, or planning agencies, with 50 or more aviation employees who participate in projects which receive federal airport aid funds are required to maintain "affirmative action" plans containing "goals and timetables" derived from "[a] comparison...of the percent of minorities and women in the employer's present aviation workforce...with the percent of minorities and women...in the total workforce" in the SMSA or surrounding area.
23 C.F.R. § 230.111 (1994)	On-the-job training program rules for federally assisted highway construction projects provide that "[t]he Washington Headquarters shall establish and publish annually suggested minimum training goals...based on the Federal-aid apportioned amounts and the minority population. A State will have achieved its goal if the total number of training slot...equals or exceeds the States's suggested minimum annual goal."
23 C.F.R. Part 230 APP. A	State Highway Agency Equal Employment Opportunity Programs. Affirmative action plans are to set "specific, measurable, attainable hiring and promotion goals, with target dates, in each area of underutilization" of women and minorities.
29 C.F.R. §§ 30.3-30.8 (1994)	Affirmative action requirements of the Department of Labor (DOL) for registered state apprenticeship programs include "goals and timetable for women and minorities." "Compliance with these requirements shall be determined by whether the sponsor has met its goals within its timetables, or failing that, whether it had made good faith efforts to meet its goals and timetables."
32 C.F.R. Part 191, § 191.5(a)(8) (1994)	DOD Civilian Equal Employment Opportunity Program establishes affirmative action guidelines and procedures for all DOD components and directs the Assistant Secretary of Defense to "[e]nsure that realistic goals that provide for significant continuing increases in the percentages of minorities, women, and people with disabilities in entry, middle, and higher grade positions in all organizations and occupations are set and accomplished until the overall DOD objective is met and sustained."
34 C.F.R. Part 100 APPENDIX VII.C. (1994)	Department of Education guidelines for eliminating discrimination in vocational education programs provide that "[w]henver the Office for Civil Rights finds that in light of the representation of protected groups in the relevant labor market there is a significant underrepresentation or overrepresentation of protected group persons on the staff of a vocational education school or program, it will presume that the disproportion results from unlawful discrimination. This presumption can be overcome by proof that qualified persons of the particular race, color, national origin or sex, or that qualified handicapped persons are not in fact available in the relevant labor market."
40 C.F.R. Part 8 (1994)	Environmental Protection Agency (EPA) equal employment opportunity and affirmative action compliance requirements issued pursuant to E.O. 11246 as applied to EPA contracts and EPA assisted construction contracts.

41 C.F.R. Part 60 (1994)	Sets forth the body of administrative rules issued by the Office of Federal Contract Compliance Programs within the Department of Labor to enforce the affirmative action requirements of E.O. 11246 on federal procurement and construction contractors. All contractors and subcontractors with federal contracts in excess of \$10,000 are prohibited by the Executive Order from discriminating and required to take affirmative action in the employer of minority groups and women. Federal contractors and subcontractors with 50 or more employees and government contracts of \$50,000 or more must develop written affirmative action compliance programs for each of their facilities. OFCCP rules direct these larger contractors to conduct a "utilization analysis" of all major job classifications and explain any utilization of minorities and women by job category when compared with the availability of qualified members of these groups in the relevant labor area. Based on this analysis, the contractor's affirmative action plan must direct its "good faith efforts" to correct deficiencies. In addition, OFCCP has established nationwide hiring goals of 6.9 percent for women in construction, and regional and local goals for minorities in construction, which are set out in an appendix to the agency's affirmative action in construction regulations. 41 C.F.R. 60-4.
48 C.F.R. 22.804 (1994)	Affirmative action program under Federal Acquisition Regulations requires written affirmative action plans of federal nonconstruction prime and subcontractors with 50 or more employees that comply with DOL regulations to assure equal opportunity in employment to minorities and women.
48 C.F.R. 52.222-23, 52.222-27 (1994)	Prescribes clause for inclusion of federal contracts that requires "[g]oals for minority and female participation, expressed in percentage terms for the Contractor's aggregate workforce in each trade on all construction work in the covered area" and "to make a good faith effort to achieve each goal under the plan in each trade in which it has employees."
48 C.F.R. 922.804-2 (1984)	Department of Energy regulations implementing the affirmative action plan requirement of E.O. 11246.

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Affirmative Action Data Paper.  
Commission on Professionals in Science and Technology

**APPENDIX III**

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## AFFIRMATIVE ACTION

A divisive debate is going on over whether women and minorities still deserve favored treatment. This debate is real, because affirmative action poses a conflict between two cherished American principles: the belief that all Americans deserve equal opportunities and the idea that hard work and merit, not race or religion or gender or birthright, should determine who is educated, who prospers, and who does not.

Thirty years ago, Lyndon Johnson defended affirmative action by arguing that people burdened by generations of bias could not be expected to compete equally, without special treatment. While that made sense in 1965, does it make sense today?

In an attempt to determine what effect affirmative action has had on helping women and minorities both prepare and participate in all sectors of society, the Commission on Professionals in Science and Technology (CPST) was asked to compile data to address this issue.

## DEMOGRAPHICS

Between 1983 and 1993, there was a drop of nearly 16% in the number of college-age youth, led by a 18.6% drop for whites, and a 9% drop for African Americans. In contrast, there was a 37% increase for Hispanics, because of their higher birth rates and increased immigration. The overall decline was the result of a 25% drop in the number of births between 1956 and 1976.

However, despite the substantial drop in the number of college-age Americans, there was no corresponding drop in total baccalaureate production, primarily because more young people continued on to college after high school graduation, as well as the return to school of many older students, primarily women. During the 20-year period (1973-1993), there was an increase in the college participation rate for all groups. However, whites show the greatest increase - 11%, compared to increases of nearly 9% for African Americans and 6% for Hispanics.

In 1993, 41.8% of white high school graduates enrolled in higher education, compared with 32.9% of African Americans and 35.8% of Hispanics. Whether white, African American or Hispanic, women were more likely than men to enroll in higher education following high school graduation.

## UNDERGRADUATE EDUCATION

While there has not been any drop in total baccalaureate production during the period of a declining college-age population, the number of bachelor's degrees awarded in science and engineering,<sup>1</sup> as well as in the natural sciences and engineering (NS&E),<sup>2</sup> dropped for both men and women from its high point in 1986 through 1991. However, in 1992, the number of baccalaureate degrees awarded to S&E as well as in NS&E started upward again, and continued its rise in 1993, reaching 366,036 and 179,3450 respectively. This compares to 335,405 and 167,570 for total S&E and NS&E respectively in 1991. Thus, as a percentage of

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<sup>1</sup> Includes the physical sciences, earth, atmospheric and ocean sciences, mathematical and computer sciences, agricultural and biological sciences, social and behavioral sciences and engineering.

<sup>2</sup> Includes the physical sciences, earth, atmospheric and ocean sciences, mathematical and computer sciences, agricultural and biological sciences and engineering. Excludes the social and behavioral sciences.

all bachelor's degrees, those in S&E fields dropped from 33.5% in 1986 to 30.5% in 1986, before starting upward and reaching 31.0% in 1993. NS&E fields dropped from 20.8% in 1986 to 15.1% in 1991, but inched upward to 15.2% in 1993.

## **Women**

Looking specifically at women over the past two decades (1973-1993), one finds there has been a significant increase in the proportion of American women who go to college. Women are now 51.2% of the U.S. population; 48.9% of the school age population (5-17), 52.1% of all high school graduates, 55.0% of total undergraduate enrollment, 53.7% of graduate enrollment and 40% of first professional degree enrollment. By 1993, women earned 58.8% of the associate degrees, and 54.4% of the baccalaureates. Although they have not reached parity in either the total S&E degrees (which includes the social and behavioral sciences) or NS&E, progress is evident.

In 1993, women received 45.3% of the S&E bachelor's degrees, but only 32.8% of the NS&E degrees. Because the drop in the proportion of NS&E baccalaureates earned by women was not as great as that of men (15.6% for women and 23.1% for men between 1986 and 1991), women increased their percentage of these degrees from 30% in 1986 to nearly 33% in 1993. There was even greater gain in a few fields, such as engineering and physics, that traditionally had fewer women.

## **Minorities**

Minorities, in particular the underrepresented groups (African American, Hispanic and American Indian), have not made as much progress as women. African Americans are 12.4% of the U.S. population, 15.4% of the school age population, and nearly 13% of the high school graduates. Among African American high school graduates, 32.9% go on to college, and earned 8% of the associate degrees and 6.4% of the bachelor's degrees by 1992. In the 1980s, the number of African Americans earning bachelor's degrees declined, but increased by 18.4% between 1990 and 1993. While their representation in all science and engineering fields is small, reaching 6% of total S&E baccalaureates in 1992, their representation in the NS&E fields is much smaller.

Hispanics are 9.5% of the U.S. population, 12% of the school-age population, and 8.6% of the high school graduates. It is important to note that between 1973 and 1993, the number of college-age Hispanics jumped by almost 37%. This compares to a drop of 18.7% for whites and 9% for African Americans. Hispanics earned only 5.4% of the associate degrees, 3.6% of total bachelor's degrees, and 4.4% of the S&E baccalaureates by 1992.

American Indians represent only about 0.8% of the U.S. population, about 1% of the school-age population and about .9% of the high school graduates. They earned less than 1% of both the associate and bachelor's degrees granted, with even lower proportions in the NS&E fields.

## **GRADUATE EDUCATION**

### **Master's**

At the master's level, women increased their proportion of total degrees from 41.4% in 1973 to 54.2% in 1993. During this 20-year period, the number of master's degrees earned by women increased 83.7% (from 109,525 to 201,220), while the number of master's

degrees earned by men increased only 9.5% (from 155,000 to 169,753). This same growth rate occurred in the number of S&E master's degrees earned by women from 1973 through 1993. In 1973, women earned 10.0% of the S&E degrees awarded; by 1993, they earned 35.8%. In the NS&E fields, women earned nearly a fourth of the master's degrees in 1993.

The proportion of underrepresented minorities earning master's degrees between 1981 and 1992 dropped slightly from 8.4% to 8.3%. Their proportion of the S&E master's degrees showed almost no difference during this period (1982-1992). However, during this period, Asian Americans increased their proportion of total master's earned by over 100%, reaching 3.6% by 1981. They increased their proportion of the S&E master's awarded more than two-fold to 7.4%.

## Doctorate

At the doctoral level, women made great strides, increasing the proportion of degrees awarded to 38% (15,108) in 1993. The progress is even more dramatic when only U.S. citizens are considered. Women increased their proportion to 45.1% in 1993 (from 19.7% in 1973). However, underrepresented minorities made very little progress, increasing their proportion of all PhDs from 5% to only 5.2% from 1981 to 1993.

The number of women and minorities earning doctorates in science and engineering defines the baseline for their presence among top researchers and faculty. In most of the math-based fields, those numbers continue to be under one-fourth of the total for women (22.7%), and only 4.4% for underrepresented minorities. However, for Asian Americans, in 1993, they earned 6.2% of all the NS&E doctorates.

Some real gains in these math-based fields are evident for U.S. women when looking at specific fields. For example, they more than tripled the number of PhDs they earned in engineering from 1983 to 1993 (from 83 to 295). This compares with nearly a doubling for U.S. men (from 1,080 to 1,930.) In other natural science fields in 1993, women earned 91 PhDs in physics, 354 in chemistry, 145 in mathematics, 82 in computer science, and 1,570 in the agricultural and biosciences.

Again, looking only at U.S. citizens, in 1993, African Americans earned only 9 PhDs in physics, 19 in chemistry, 5 each in math and computer science, and 68 in the agricultural and biosciences. Hispanics earned 22 in physics, 45 in chemistry, 9 in math, 5 in computer science and 107 in the agricultural and biosciences. Native Americans earned only a total of 21 PhDs in all the NS&E fields.

In contrast, while non U.S. citizens on temporary visas earned 6,974 PhDs in the NS&E fields, non U.S. citizens on permanent visas earned a total of 1,272 PhDs.

## EMPLOYMENT TRENDS

As of May 1995, women were 45.6% of the U.S. civilian workforce, but only 22.4% of the total S&E labor force in 1993 - 20% at the bachelor's level, 26.5% of the master's level, and 22.9% of the doctoral workforce. However, there are vast differences in labor force participation by field. For example, women are 49% of the labor force in the social sciences, 32.9% in the life sciences, 30.7% in the computer and math sciences, and slightly over a fourth (25.9%) in chemistry, but are only 7.8% in engineering, 8.6% in physics and 23.3% of the economists. In psychology and sociology/ anthropology, they represent well over 50% of the labor force.

## Doctorates

In looking specifically at the doctoral scientists and engineers, we find that almost 48% are employed in academe, 30.5% in private for profit organizations (business and industry), slightly over 10% in federal, state and local government, and the remainder in other sectors. However, employment sector varies by gender and ethnicity. Women PhDs are more likely to be employed in academe or self-employed than are their male colleagues; in contrast men are more likely to be employed in private-for-profit settings. However, most of these differences in sector employment are related to differences in field of degree. For example, women are less likely than men to be engineers or physical scientists, who tend to be employed in industry. Women's greater tendency to be self-employed is also related to field of degree. Women are more likely than men to be psychologists and psychologists are more likely than other scientists and engineers to be self-employed. Over 55% of underrepresented minorities are employed in academia while Asian Americans are more likely to be employed in private-for-profit organizations than in academe. Again, this sector difference is related to field of degree.

Male PhDs reported an unemployment rate of 2.0% in 1993, compared to 3.2% for women, while male doctoral engineers reported a rate of 1.7% compared to 2.4% for women. However, among PhD social scientists, the unemployment rates are more nearly equal - 1.4% for women and 1.5% for men.

In higher education, the number of full-time faculty of color increased nearly 50% (48.6) in a decade (1981-1991), compared with a gain of only 7.6% for whites. This growth varied considerably among ethnic groups. However, despite this large increase, faculty of color still only represented 12.3% of all full-time faculty and only 8.5% of full professors in 1991.

## Salaries

Women PhDs earned only 79% of the salaries of their male colleagues. However, in a draft report by the National Science Foundation, a statistical analysis was made in which a number of differences were examined and a dollar value assigned to these differences helped to explain this salary gap. For example, women are on the average younger than men and have majored more frequently in fields such as the social sciences that have relatively low pay. In order to determine how much of the 21% (\$13,200) doctoral gender salary gap could be "explained" by differences between men and women, variables including years from PhD, S&E degree field, other background variables, work-related employee characteristics, employer characteristics, type of work performed, and indicators of "life choices," were examined. Together these variables "explained" \$11,700 of the observed \$13,200 difference between the average salary of male S&E PhDs and the average salary of female S&E PhDs. The residual gap could have a number of possible causes, including measures of productivity, number of books and articles published, prestige of school or department from which the individuals received his or her degree, prestige of the school or department at which employed. In addition, some of the "unexplained" gender salary gap may be attributable to "unequal pay for equal work."

## AFFIRMATIVE ACTION - HAS IT HELPED?

### Military

“The military is the only place in America where blacks routinely boss whites around,” said *Charles Moskos*, a professor at Northwestern University. After two decades of affirmative action, minorities account for 39.5% of all Army personnel, 29.3% of Navy, 22.5% of Air Force, and 28.6% of Marine Corps personnel. More importantly, more have been advanced to higher ranks.

The armed forces have become what some feel is one of the most integrated institutions in the country, primarily because of orders which mandate affirmative action and the fact that all the top jobs are filled by promotions from within the organization, says *Robert Calvert* in the September 1995 issue of *CAREER OPPORTUNITY NEWS*.

The number of African American officers in higher ranks as a percent of the total serving in 1980 and 1994 are shown at the end of this document. However, the minority total is underestimated since officers from other minorities are not included.

The data show that the Army has achieved the greatest success with its affirmative action programs. Among the techniques used by the Army has been to increase the number of historically black colleges with ROTC units; they in turn contributed almost half of the 5,623 newly-commissioned African American officers in 1992. The percentage of African American officers serving in the Army is significantly higher at all ranks than any of the other services. However, all show a much higher percentage of African American officers at the entry level (second lieutenant or ensign): Navy, 7.0; Air Force, 5.6; and Marine Corps, 6.8 percent.

### Summary

While the military and some corporations have made dramatic strides, the participation of minorities in higher education, and particularly in science and engineering employment has been less impressive. Although progress has been made, much remains to be done.

Affirmative Action certainly has made a difference in the educational attainment of women. Over the past two decades, women have made tremendous progress in preparing themselves for participating fully in all segments of society. Although there is still a way to go in the NS&E fields, there also is evidence of progress being made. One of the biggest success stories for affirmative action has occurred in the professional fields of medicine and law. Once the “quotas” were removed and women were allowed to compete equally with men for medical school slots and law school slots, their proportion increased almost to parity. Women today are over 40% of all enrollments in first professional degree programs.

However, the barriers of social prejudice and custom that impede progress for women and minorities in science and engineering have not been removed, but some of them are slowly being edged aside, particularly for women. The isolation experienced by women working in engineering and some science fields has decreased as more women enter these fields.

Clifford Adelman writes, “The United States will enter the next century with a remarkable edge over its global competitors. U.S. women, of all races, are the best educated and trained in the world and will constitute 64% of the new entrants to the workforce over the next 10 years.” It will be up to Americans to capitalize on that edge and to continue efforts to increase the participation of minorities.

**SCIENTISTS AND ENGINEERS IN THE LABOR FORCE BY GENDER, OCCUPATION AND DEGREE, 1993**

FIELD OF OCCUPATION	DEGREE LEVEL							
	TOTAL		Bachelor's		Master's		Doctorate	
	MEN	WOMEN	MEN	WOMEN	MEN	WOMEN	MEN	WOMEN
<b>ALL FIELDS</b>	2,493,000	720,000	1,421,000	358,000	677,000	244,000	364,000	108,000
<b>Computer/Math Sciences</b>	667,000	296,000	423,000	204,000	193,000	81,000	46,000	10,000
Computer Science	592,000	255,000	405,000	192,000	165,000	59,000	19,000	3,000
Math Science	30,000	18,000	11,000	8,000	11,000	8,000	7,000	3,000
ComputerMath Teachers	45,000	23,000	7,000	5,000	17,000	14,000	21,000	4,000
<b>Life Sciences</b>	212,000	104,000	68,000	37,000	41,000	32,000	87,000	30,000
Agricultural/Food Science	34,000	10,000	19,000	6,000	8,000	2,000	7,000	2,000
Biological Science	110,000	69,000	28,000	25,000	21,000	18,000	55,000	22,000
Environmental Science	21,000	3,000	15,000	2,000	5,000	1,000	1,000	
Life Science Teachers	48,000	21,000	6,000	4,000	7,000	9,000	24,000	7,000
<b>Physical Sciences</b>	212,000	55,000	81,000	25,000	56,000	15,000	75,000	14,000
Chemistry	80,000	28,000	40,000	16,000	16,000	6,000	24,000	6,000
Physics and Astronomy	32,000	3,000	6,000		9,000	1,000	17,000	2,000
Other Physical Sciences	11,000	4,000	5,000	1,000	4,000	2,000	1,000	1,000
Physical Science Teachers	32,000	9,000	3,000	3,000	7,000	2,000	22,000	4,000
<b>Social Sciences</b>	167,000	161,000	18,000	21,000	62,000	85,000	83,000	51,000
Economics	23,000	7,000	5,000	3,000	10,000	4,000	7,000	1,000
Political Science	5,000	3,000	2,000	2,000	2,000		1,000	1,000
Psychology	68,000	100,000	4,000	10,000	27,000	58,000	35,000	29,000
Sociology/Anthropology	6,000	8,000	1,000	3,000	3,000	3,000	2,000	2,000
Other Social Sciences	12,000	14,000	4,000	3,000	5,000	8,000	3,000	1,000
Social Science Teachers	54,000	30,000	2,000	2,000	15,000	11,000	35,000	17,000
<b>Engineering</b>	1,236,000	105,000	832,000	70,000	325,000	31,000	73,000	4,000
Aero Engineering	80,000	6,000	49,000	4,000	25,000	2,000	5,000	
Chemical Engineering	64,000	10,000	39,000	5,000	17,000	4,000	7,000	
Civil Engineering	166,000	15,000	117,000	11,000	44,000	4,000	4,000	
Electrical Engineering	333,000	17,000	222,000	11,000	94,000	5,000	16,000	1,000
Industrial Engineering	60,000	6,000	45,000	5,000	15,000	1,000	1,000	
Mechanical Engineering	228,000	12,000	171,000	8,000	49,000	3,000	6,000	1,000
Other Engineering	278,000	36,000	186,000	24,000	73,000	11,000	18,000	1,000
Engineering Teachers	27,000	3,000	3,000	1,000	7,000	1,000	16,000	1,000

NOTES: Only postsecondary teachers are included. An additional 31,000 men and 10,000 women are employed in science and engineering holding other degree  
 SOURCE: 1993 National Survey of College Graduates National Science Foundation

**African American Officers Serving 1980 and 1994**  
(Percent of total in rank)

RANK	1980	1994
<b>Army</b>		
General	5.5	6.5
Colonels	4.6	4.9
Lieutenant-Colonels	4.8	8.3
Majors	4.4	12.5
Captains	7.7	12.4
<b>Navy</b>		
Admirals	1.2	1.7
Captains	0.8	1.7
Commanders	0.6	3.2
Lieutenant-Commanders	1.2	3.7
<b>Air Force</b>		
Generals	2.8	2.0
Colonels	1.8	2.1
Lieutenant-Colonels	2.1	7.4
Majors	2.3	7.4
Captains	4.4	5.5
<b>Marines</b>		
Generals	1.5	0.0
Colonels	0.0	2.9
Lieutenant-Colonels	0.6	3.9
Majors	1.6	4.0
Captains	4.4	4.8

SOURCE: Department of Defense Data, cited in *New York Times*, 1995

# AFFIRMATIVE ACTION DATA TABLES

## EDUCATION PARTICIPATION

### Women

#### All Fields

. . . Associate Degrees . . . . .	1
. . . Bachelor's Degrees . . . . .	2
. . . Master's Degrees . . . . .	3
. . . Doctorate Degrees . . . . .	4
. . . First Professional Degrees . . . . .	5

#### Science and Engineering

. . . Bachelor's Degrees . . . . .	6
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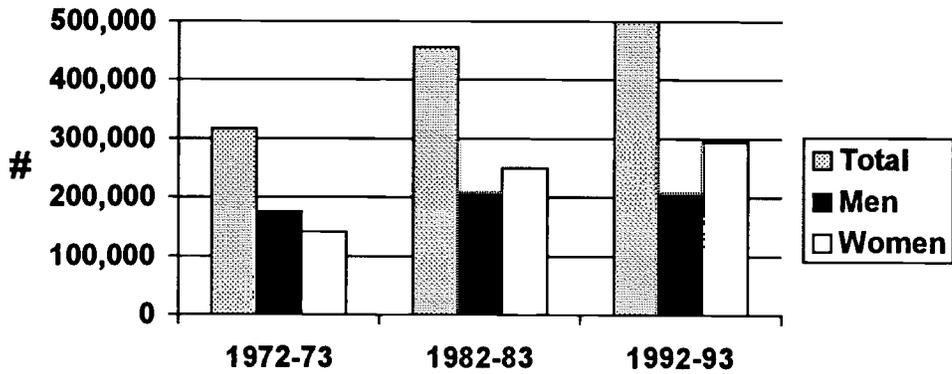
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## EMPLOYMENT

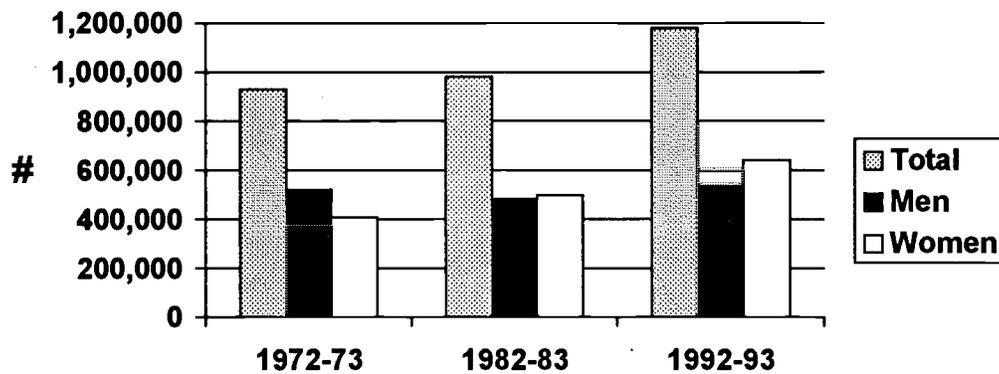
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## ASSOCIATE DEGREES



The number of associate degrees earned by women nearly doubled from 1973-1993. In 1973, women earned 140,761 associate degrees (or 44.5% of the total). By 1993, they earned 58.8% of the 500,000 associate degrees awarded. During this same time period, although the number of associate degrees earned by men increased 13.1%, their proportion dropped from 55.5% to 47.2%.

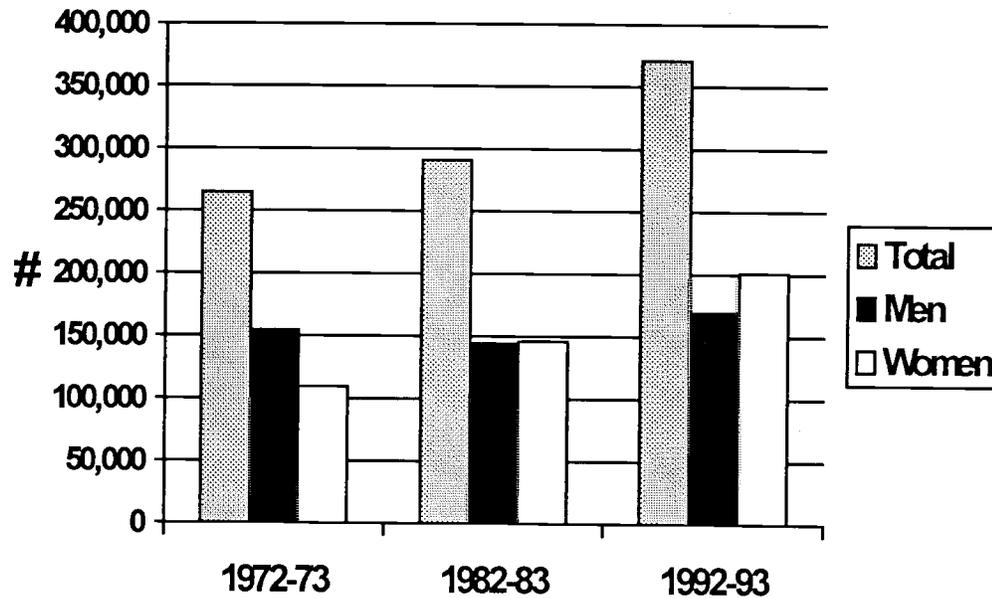
## BACHELOR'S DEGREES



Over the 20-year period from 1973 to 1993, the number of bachelor's degrees awarded has increased 26.8%. However, most of that growth is attributable to women. The number of women earning baccalaureate degrees increased 57% (from 408,738 to 641,742) while the number of men earning bachelor's degrees grew only 3% (from 521,534 to 537,536).

In 1973, women earned 43.9% of bachelor's degrees awarded. By 1993, they earned 54.4%.

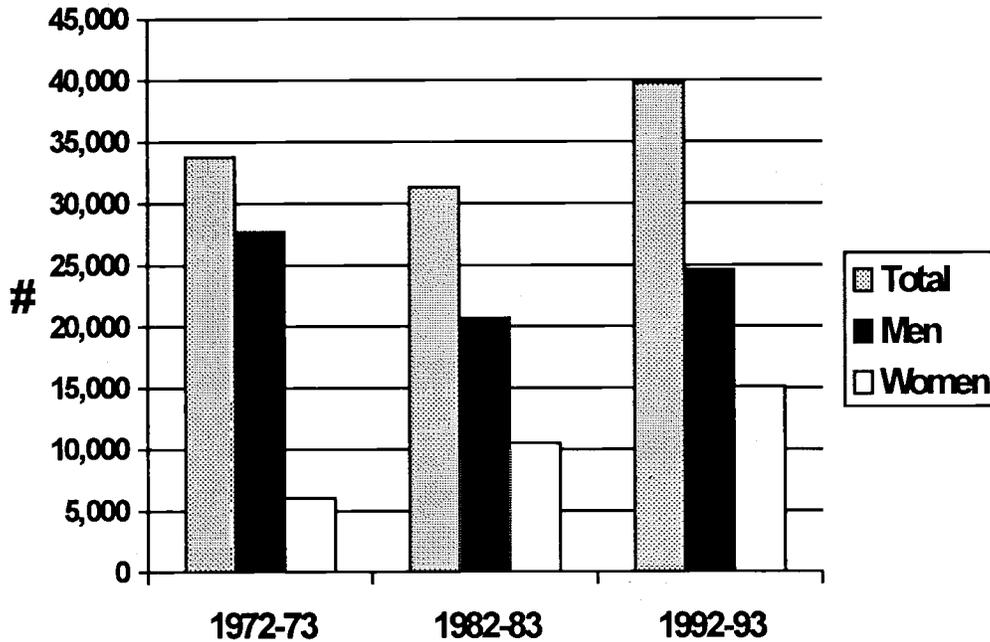
# MASTER'S DEGREES



Women have made tremendous progress in increasing their proportion of all degrees. At the master's level, women received 41.4% of all degrees granted in 1973. By 1983, they received slightly over half, and by 1993, they earned 54.2% of master's degrees granted.

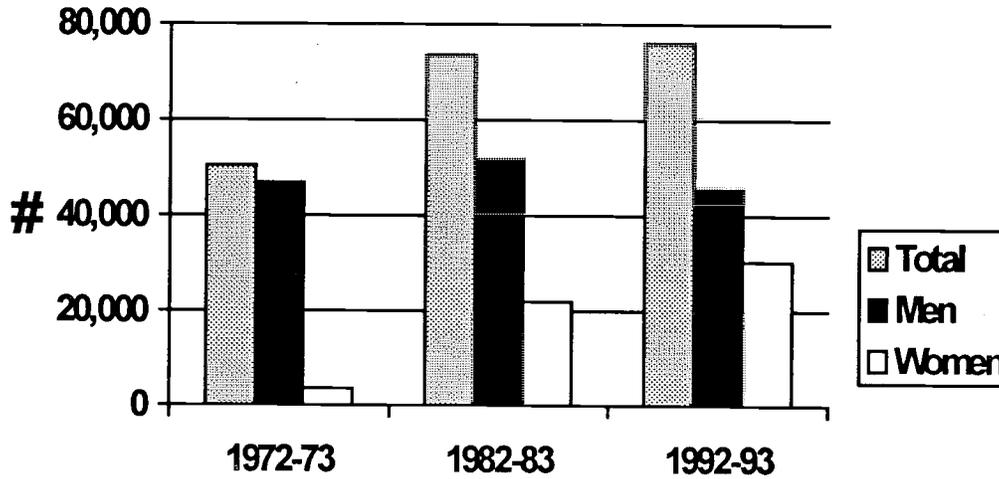
During the 20-year period (1973-1993), the number of master's degrees earned by men increased 9.5% (from 155,000 to 169,753), while the number of master's degrees earned by women grew 83.7% (from 109,525 to 201,220).

## Ph.D. DEGREES



In the 20-year period (1973-1993), the number of women earning PhDs grew at an astounding rate of 148%, compared to a drop of almost 11% for men. This has resulted in women more than doubling their proportion of PhDs, from 18% to 38% (6,085 to 15,108). However, when examining U.S. citizens only, the proportional increase is even more dramatic. Over the 1973-1993 period, women increased their proportion among U.S. citizens, earning 19.7% in 1973 to 45.1% in 1993 (from 5,495 to 11,902). Although growth occurred in every field, some fields were more dramatic than others.

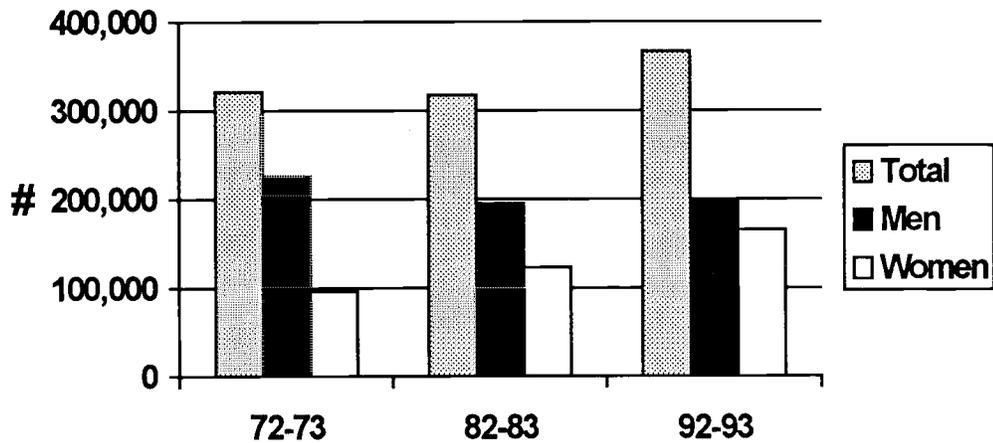
## FIRST PROFESSIONAL DEGREES



The number of first professional degrees awarded to women grew at an astronomical rate from 1973 through 1993, increasing by 745% (from 3,608 to 30,503) during this period, while the number of first professional degrees earned by men actually dropped almost 3% (from 46,827 to 45,565). In 1972-73, women earned 7.2% of the first professional degrees; in 1982-83, 29.9%; and in 1992-93, 40.1%.

The phenomenal increase was true in both the health fields, where they increased their proportion from 6.7% to 39.9% (from 1,166 to 11,771) and in the non-health fields, which include primarily law, from 7.4% to 40.2%. Men experienced a drop of 9.4% in the health fields and drop of 9% in the non-health fields.

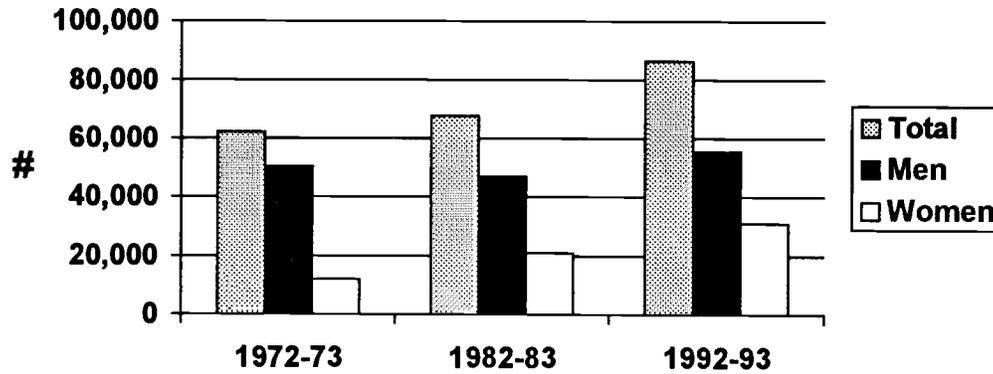
## S&E BACHELOR'S DEGREES



The number of S&E baccalaureates increased 14% from 1973 through 1993. However, this was due entirely to a 72% increase by women (from 95,995 to 165,720). The number of men earning bachelor's degrees in science and engineering dropped 11% (from 225,090 to 200,315) in this time period.

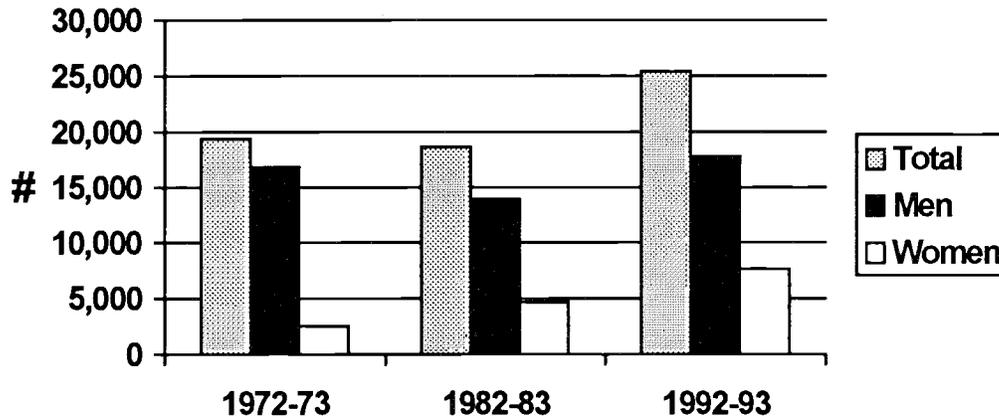
Women showed tremendous progress in a number of specific science and engineering fields over the 1973-1993 period. In 1973, women received only 1.2% of the bachelor's degrees in engineering. By 1993, they earned almost 16%. Women more than doubled their proportion of physical science degrees, from 15.8% to 33.6%. Almost three quarters of the psychology baccalaureates were awarded to women in 1993 (compared to less than 50% in 1973).

## S&E MASTER'S DEGREES



The number of master's degrees awarded in the science and engineering fields increased by 39.3% from 1973 through 1993. (62,046 to 86,425). However, that growth was due almost completely to the 162.2% increase of S&E master's degrees awarded to women. Women earned 11,813 (19.0%) master's degrees in 1973 and 30,971 (35.8%) in 1993. During this same period, men registered a growth of 10.4% (from 50,233 to 55,454).

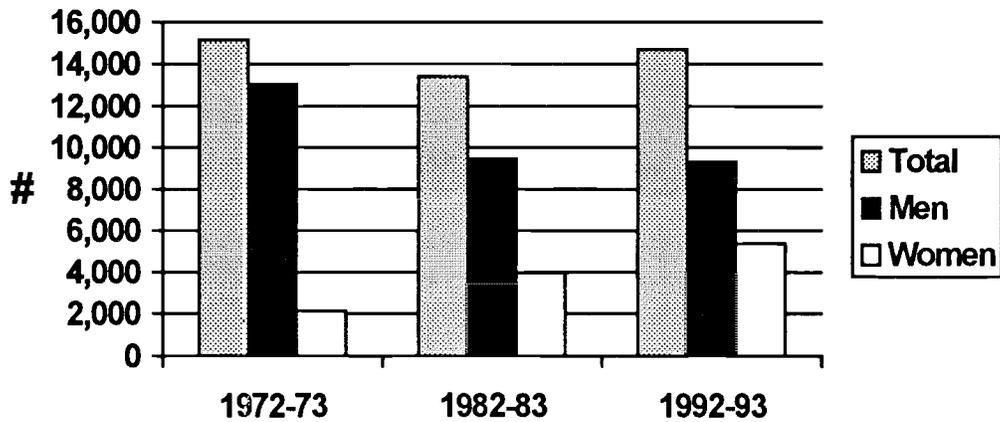
## S&E Ph.D. DEGREES



Women more than tripled the number of doctorates they earned in science and engineering from 2,520 to 7,652 during the two decades (1973-1993). Over this same time period, men experienced only a 5.5% increase in the number of S&E PhDs they earned (from 16,853 to 17,786).

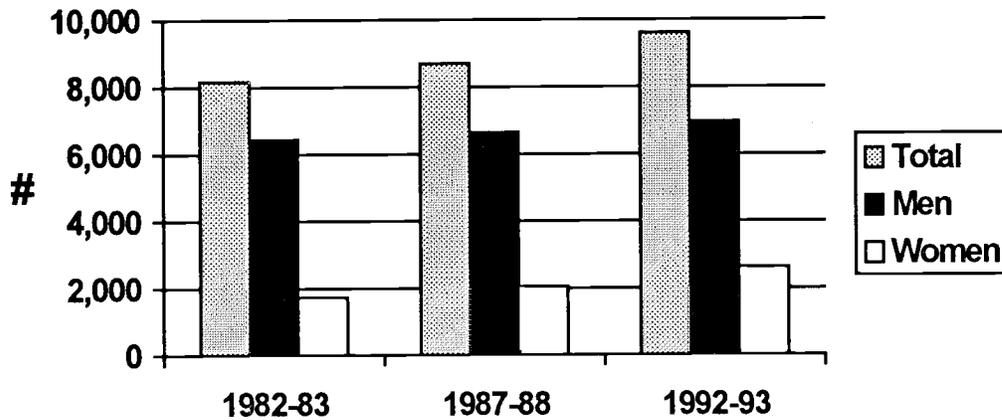
Some fields show much larger gains than others. For example, in engineering, in 1973 women earned only 46 doctorates (or 1.4%), while in 1993, they earned 521 (9.1%). In the physical sciences, women's proportion grew from 6.8% (235) to 21.2% (783). During this same time period, the number of engineering doctorates awarded to men grew by 55.5% (from 3,328 to 5,175) while the number of PhDs in the physical sciences earned by men dropped 9.1% (from 3,209 to 2,917).

## S&E Ph.D. DEGREES (U.S. Citizens)



The proportion as well as the absolute number of U.S. citizens earning doctorates in science and engineering has dropped from 78% (15,155) in 1973 to 57.8% (14,708) in 1993. The drop would have been much more pronounced if women had not increased their proportion so dramatically. In 1972-73, of the S&E PhDs earned by U.S. citizens, women earned 14.0% (2,127). By 1982-83, although total S&E PhDs awarded to U.S. citizens dropped 11.6% (from 15,155 to 13,403), the number awarded to women increased to 3,946 (29.4%). In 1992-93, women earned 36.7% (5,398) of the 14,708 doctorates awarded to U.S. citizens.

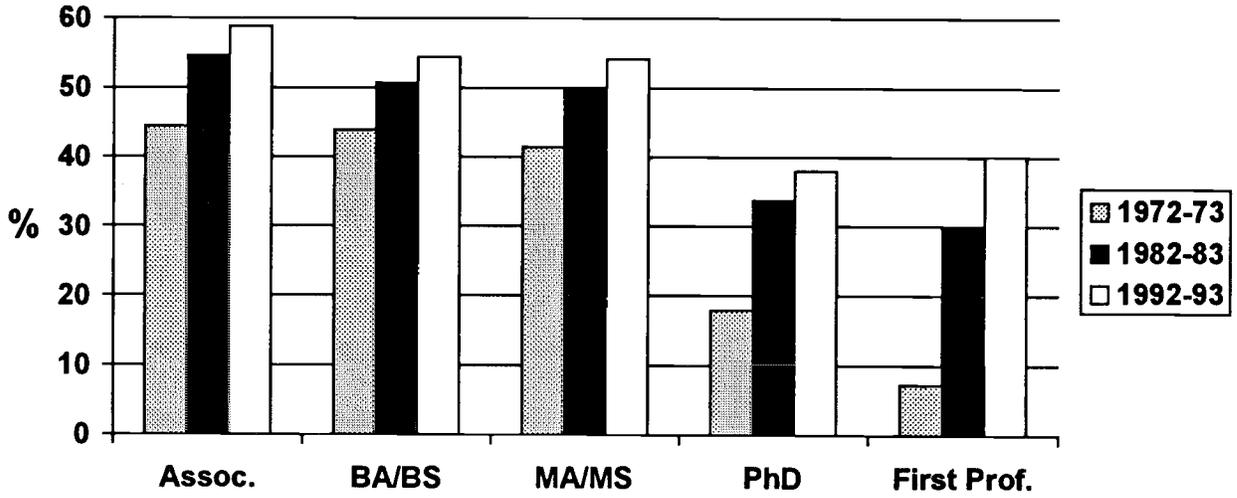
## Ph.D. DEGREES IN NS&E (U.S. Citizens)



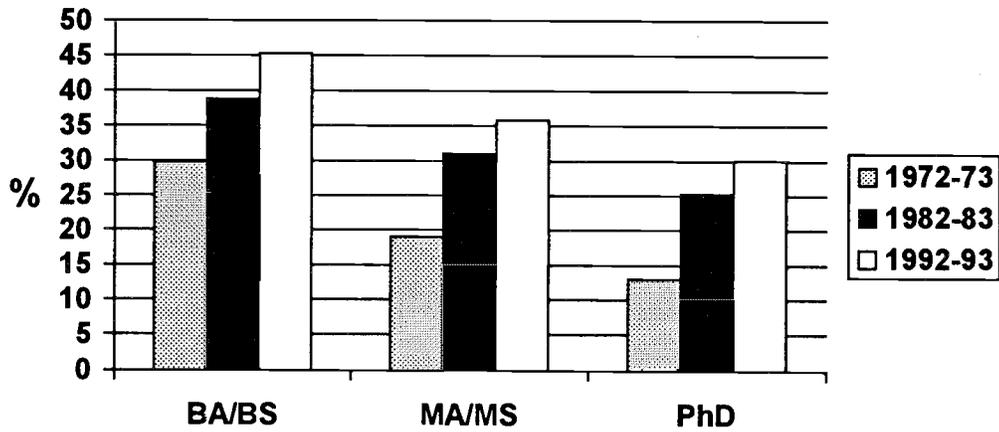
In the 11-year period (1982-83 - 1992-93), the number of U.S. citizens earning doctoral degrees in the natural sciences and engineering has grown 17.7% from 8,160 to 9,602. When the non-U.S. citizen component is added in, the number of doctorates awarded in NS&E fields grew by 52.6% (from 11,693 to 18,251). Therefore, the proportion of doctorates earned by U.S. citizens in the natural sciences and engineering declined from 69.8% of the total in 1983 to 52.6% in 1993.

It is important to point out that the number of NS&E doctorates awarded to U.S. citizens would have shown very little growth if women had not matched the percentage growth of the non-citizen component. Women's proportion of NS&E increased 52.6% over the 11-year period from 1,723 to 2,630, while the growth rate for men was only 8.3% (from 6,437 to 6,972).

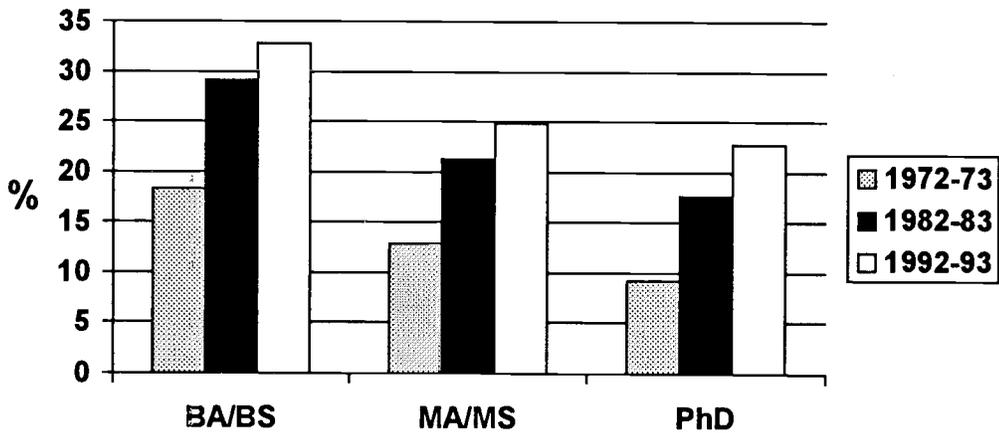
### % WOMEN BY DEGREE LEVEL



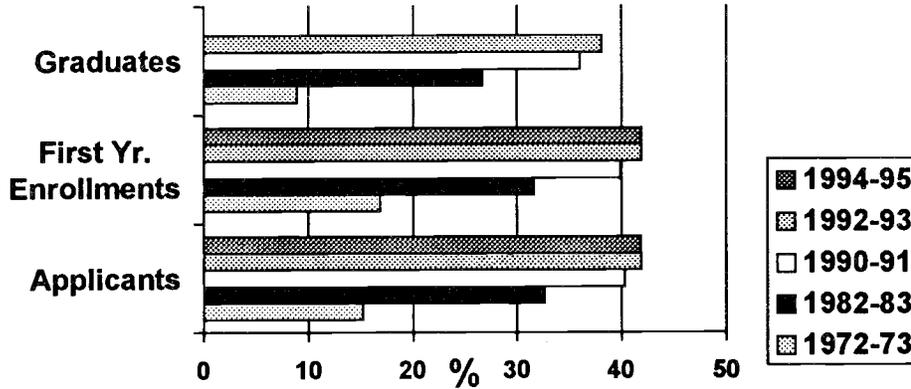
### % WOMEN EARNING S&E DEGREES



### % WOMEN EARNING NS&E DEGREES

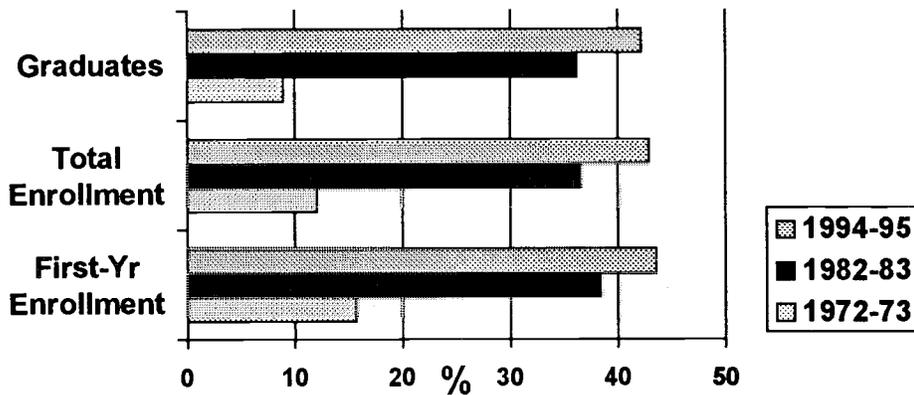


## WOMEN IN MEDICINE



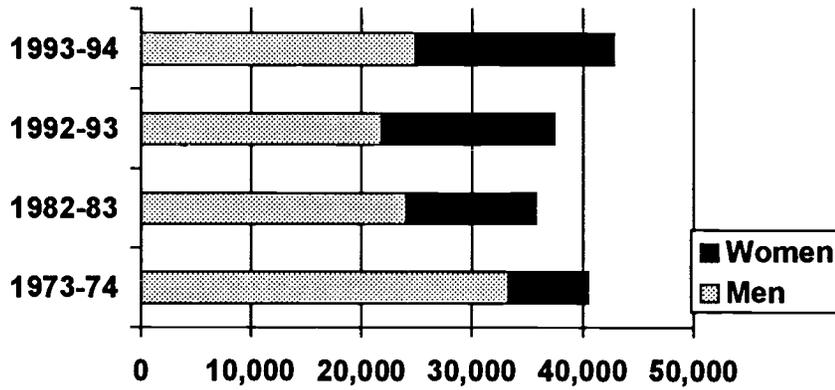
Women have made much progress in preparing for careers in medicine. In some twenty years, they increased their proportion of the applicant pool from 15.2% to nearly 42%. During this same time period, they increased their share of the total pool of graduates from 8.9% to 38.1%

## WOMEN IN LAW

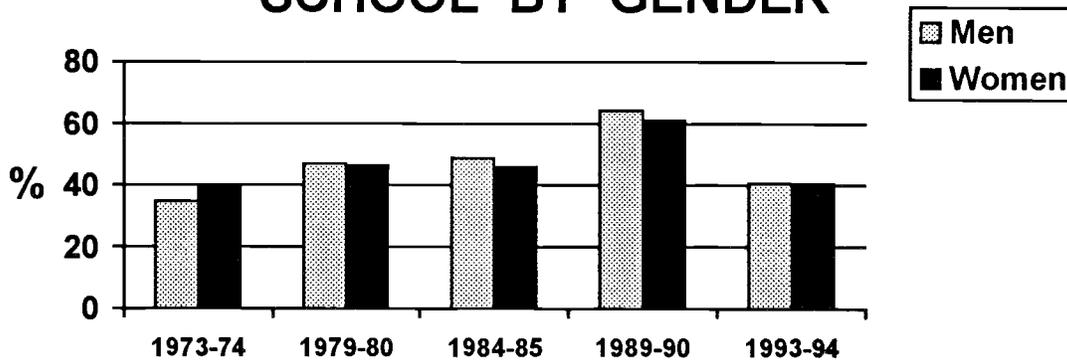


Women have also made tremendous advancements in preparing for careers in law. In 1973, women were only 15.7% of first year enrollments in law schools. By 1994-95, they represented 43.6% of first-year enrollments. In 1972-73, women earned 8.0% of the law degrees, but by 1993-94, they were 42.2% of all graduates.

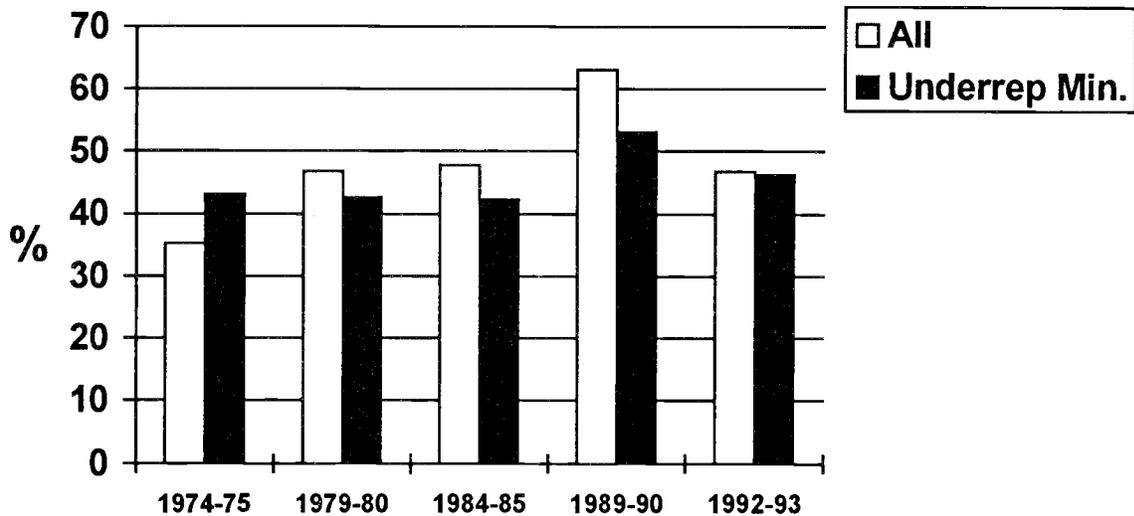
## APPLICANTS IN MEDICAL SCHOOL



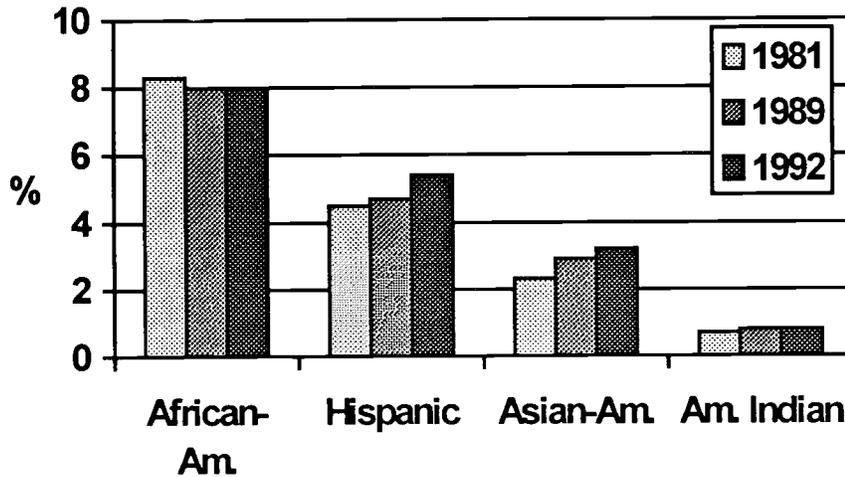
## ACCEPTANCES IN MEDICAL SCHOOL BY GENDER



## ACCEPTANCES IN MEDICAL SCHOOLS BY UNDERREP. MIN.

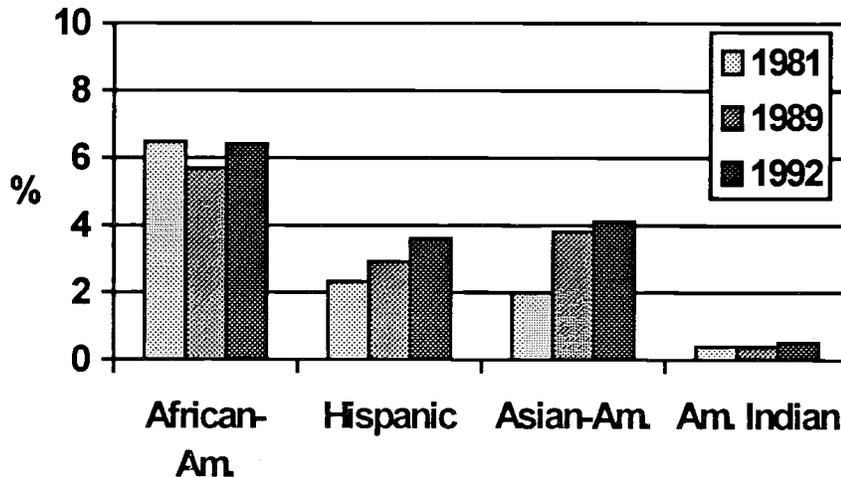


## Associate Degrees Awarded



From 1981 through 1992, while the number of associate degrees granted increased 20%, the number awarded to underrepresented groups showed very little growth. Although Hispanics increased their proportion from 4.5% to 5.4%, the proportion earned by African Americans decreased slightly from 8.3% to 8.0%.

## Bachelor's Degrees Awarded



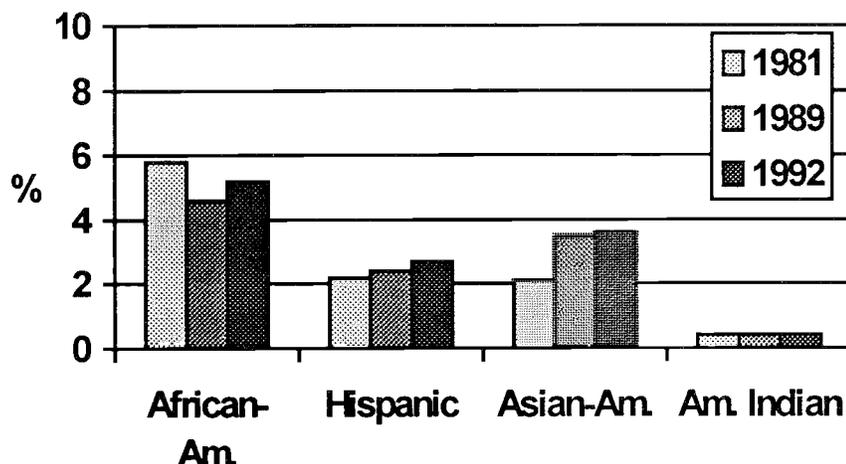
The total number of baccalaureates increased nearly 21% from 1981 to 1992 - from 934,800 to 1,129,833. This occurred despite a drop of 7.5% in the total college-age group 18-24 (from 29,365,000 to 27,156,000) during that time. But, the number of African Americans earning bachelor's degrees dropped in the 1980s, both in absolute terms as well as proportionately. In 1990, that number started increasing, reaching 6.4% by 1992 - still below their 6.6% proportion in 1982. African Americans are becoming a larger proportion of the school-age population. In 1975, they were 13.5% of the school-age population (5-17), increasing to 14.8% in 1980, 15.3% in 1990, and 15.4% in 1993.

Hispanic Americans showed steady progress throughout the 1980s both in absolute numbers as well as proportionately. By 1992, Hispanics earned 3.6% of the bachelor's degrees conferred. The number of bachelor's degrees earned by American Indians increased 44% between 1981 and 1992 (from 3,593 to 5,176), but their proportional share of baccalaureates only increased from 0.3% to 0.4%. As was true with African Americans, Hispanics are becoming an increasingly larger proportion of the school age population.

The largest gains both proportionately as well as in absolute terms were registered by Asian Americans. From 1981 to 1992, the number of Asian Americans earning baccalaureates jumped 148% (from 18,794 to 46,720), and as a result their proportion doubled - from 2.0% to 4.1% of total bachelor's degrees granted.

Except for Asian Americans, women of color earned more baccalaureates than did men of color.

## Master's Degrees Awarded



The number of master's degrees awarded from 1981 to 1992 increased 18.5% - from 294,183 to 348,682. However, not all racial/ethnic groups showed equal progress. Some groups showed declines.

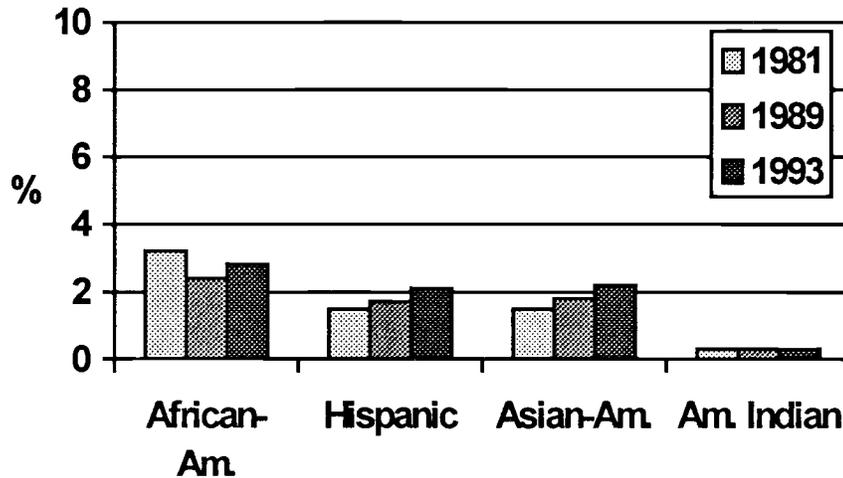
While the total number of master's degrees earned by African Americans increased 5.7% (from 17,133 to 18,116) during the 1981-1992 period, their proportion decreased from 5.8% to 5.2%. Although the proportion of master's degrees earned by American Indians remained at 0.4% from 1981 to 1992, the absolute number received rose 23% - from 1,034 to 1,273.

Hispanic Americans increased both their proportion (from 2.2% to 2.7%) and their number of master's degrees (up 45% from 6,461 to 9,358).

Not surprisingly, the largest percentage increase in master's degrees granted was registered by Asian Americans, who received 101% more master's degrees in 1992 than in 1981. They increased their proportion from 2.1% to 3.6%. During this same time frame, the proportion of master's degrees granted to whites decreased from 82% to 77%.

It is interesting to note that with the exception of Asian Americans, women received more master's degrees than did men, regardless of ethnic group.

## Ph.D.s Awarded

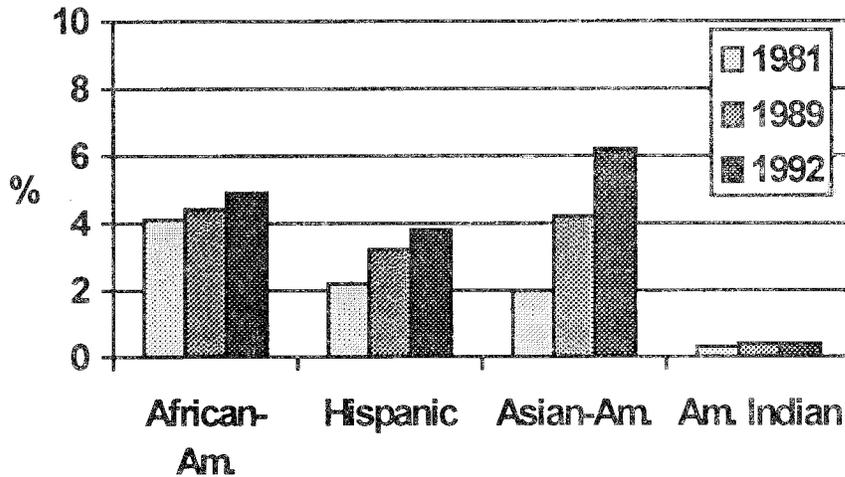


Little progress in the number of doctorates earned by African Americans was evident during most of the 1980s. However, from 1988, the number of PhDs earned by African Americans started upward and reached 1,106 (2.8%) in 1993.

Hispanic Americans showed slow progress in increasing their proportion of doctorates awarded from 1981 to 1993. In 1981, Hispanics earned 464 (1.5%) doctorates, and in 1993, they earned 834 (or 2.1%). Although Asian Americans registered a 91.6% increase in the number of PhDs earned (from 465 in 1981 to 891 in 1993), their proportional share increased only from 1.5% to 2.2%.

In the 11 year period (1981-1993), American Indians increased the number of PhDs earned only minimally from 85 to 119, and their proportion remained at 0.3%. The largest proportional increase was shown by foreign nationals (from 16.78% to 30.6%).

## First Professional Degrees

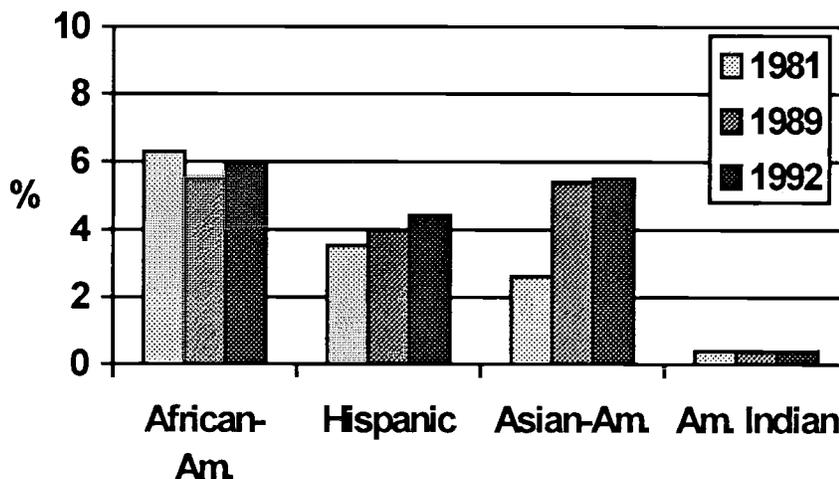


The only level of educational attainment in which all people of color showed increases from 1981 to 1992 was at the first professional degree level. Asian Americans increased their proportion three-fold in the 1981 to 1992 period (from 1,456 to 4,455). African Americans showed slow but steady progress during this time period - from 2,931 (4.2%) to 3,560 (4.9%). Hispanics earned 2.2% (1,542) of the first professional degrees in 1981, but 3.8% (2,766) in 1992.

It is important to note that during the 1981 to 1992 period, total first professional degrees increased only 1.1% (from 71,340 to 72,129) and whites showed a 7.4% decline in the number of first professional degrees earned (from 64,551 to 59,800). Thus, by 1992, whites received 82.9% of these degrees, compared to 90.5% in 1981.

The number of college-age youth declined nationwide during the 1980s and into the 1990s. From 1983 to 1993, the college age population declined 15.7%, with the number of whites dropping 18.7%. While the number of college-age African Americans also dropped 9% during this period, Hispanics jumped by 36.9%.

## S&E Bachelor's Degrees

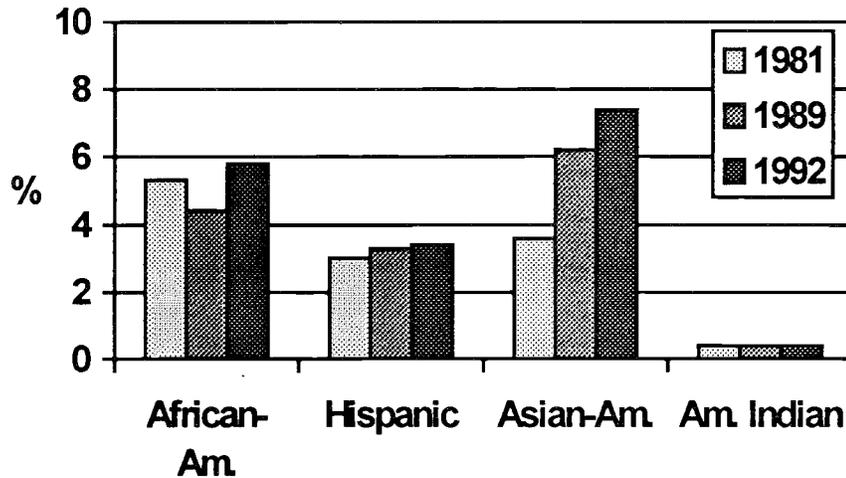


Overall, there was very little movement in the proportion of science and engineering baccalaureates earned by underrepresented minorities from 1981-1992. In 1981, underrepresented minorities earned only 10.2% of the total S&E degrees and in 1992, that proportion had inched upward to 10.7%. This slow progress is occurring despite the fact that underrepresented minorities are becoming an increasingly larger proportion of the U.S. population. In 1980, these groups represented 18.6% of the population; in 1990, that proportion had risen to 21.9%.

The proportion of S&E bachelor's degrees earned by African Americans dropped during most of the 1980s, but started upward again, reaching 6% in 1992. Hispanics increased their proportion of S&E baccalaureates slowly from 1981-1992, growing from 3.5% to 4.4%. Although the number of S&E bachelor's degrees earned by American Indians increased from 1,430 to 1,594, their proportion remained at 0.4%.

During the 1981-1992 period, Asian Americans increased their proportion of S&E bachelor's degrees from 2.6% to 5.5%.

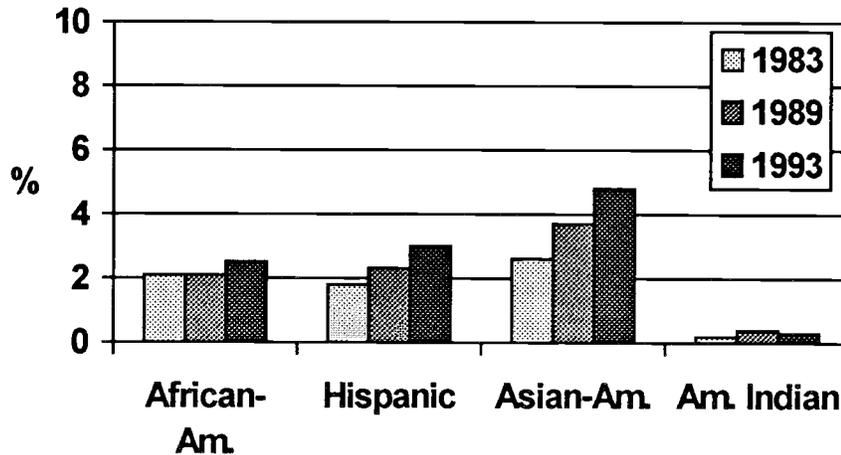
## S&E Master's Degrees



As was true when examining total master's degrees, African Americans experienced a decline in the number of degrees awarded at this level during most of the 1980s. However, by 1987, they started upward again, and by 1992, reached 4,424 (or 5.8%) of the science and engineering master's degrees awarded. During the 1981-1992 period, Hispanics again showed slow but steady progress, increasing their proportion from 3.0% (2,052) to 3.4% (2,608). Despite a small increase in the number of master's degrees earned by American Indians, (from 257 to 319), their proportion remained at 0.4%.

Asian Americans more than doubled the number of S&E master's degrees earned in the 1981-1992 period (2,481 to 5,635), and as a result increased their proportion from 3.6% to 7.4%. During this period, the proportion of S&E master's degrees earned by whites dropped from 87.0% to 83.3%, although the absolute number increased (from 60,407 to 63,089).

## S & E PhDs Awarded (U.S. Citizens)



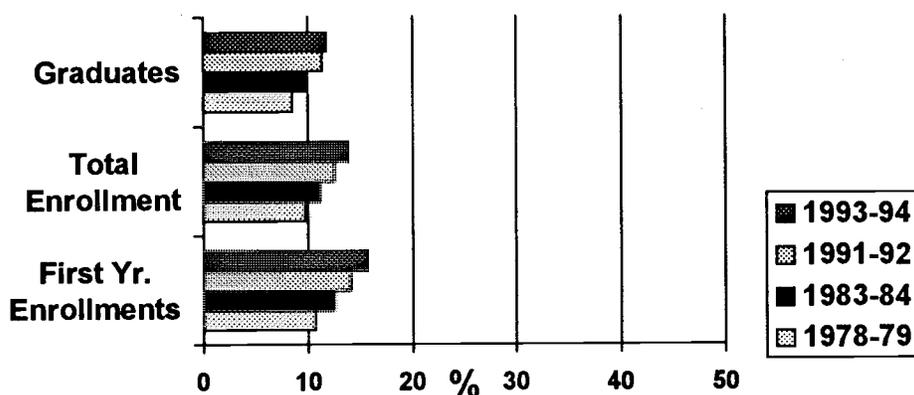
The total number of S&E doctorates earned by U.S. citizens increased 9.7% from 1983 to 1993, while the proportion of S&E doctorates earned by underrepresented groups in this same time period grew from 4.1% to 5.7%. The number of doctorates earned by Asian Americans increased over 100% in the 1983-1993 period (from 345 to 710), which resulted in their proportion growing from 2.6% in 1983 to 4.8% in 1993.

The number of African American PhDs increased from 283 to 363, although their proportion rose only from 2.1% to 2.5%. The number of Hispanics increased from 237 to 439 (from 1.8% to 3.0%), while the number of American Indians increased from 27 to 41 (0.2% to 0.3%).

The proportion of science and engineering doctorates earned by foreign nationals jumped dramatically during this time period, from slightly over 22% to nearly 39%.

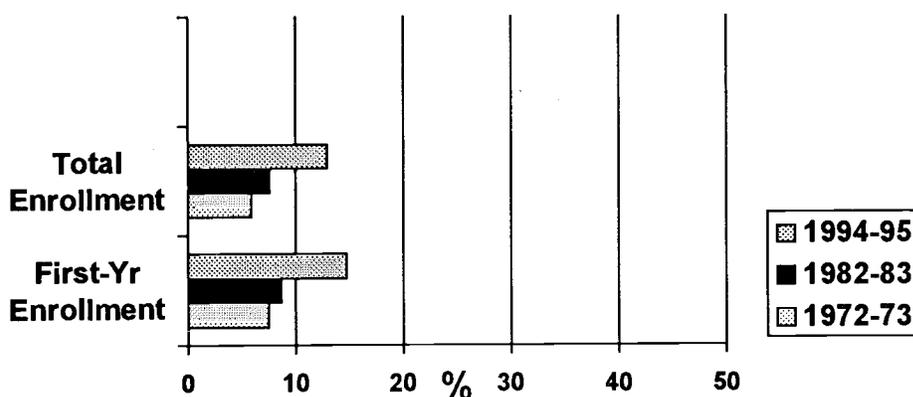
As was true at both the bachelor's and master's degree levels, over half of the S&E PhDs earned by underrepresented groups are in the social and behavioral sciences. In the natural sciences and engineering (NS&E), although the number of doctorates earned by underrepresented minorities nearly doubled (from 204 to 423), their proportion still was only 4.4% (up from 2.5%). From 1983 to 1993, the number of Asian Americans earning doctorates in NS&E increased 117%, from 275 to 599. In 1993, Asian Americans earned 6.2% of the NS&E PhDs awarded.

## MINORITIES IN MEDICINE



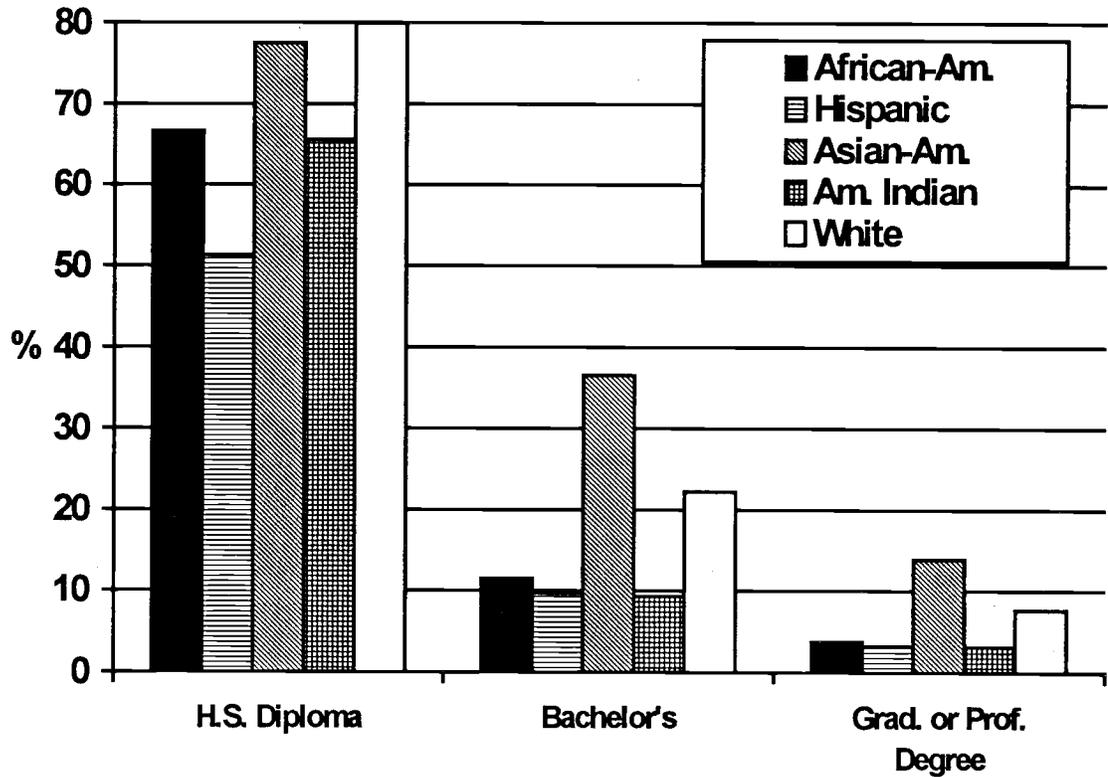
Underrepresented minorities have increased their proportion of first-year enrollments in U.S. medical schools from 10.7% to 15.7% over the past 15 years, (1978-79 - 1993-94), going from 1,773 to 2,691. A similar trend exists in total enrollments, where underrepresented minorities were 9.7% of total enrollments in 1979 and moved to 13.9% by 1994. They also increased their proportion of medical graduates from 8.5% to 11.8% during this time period.

## MINORITIES IN LAW



Minorities have also increased their participation in law, increasing their share of first-year enrollments in ABA-accredited law schools from 7.5% to 14.7% and their proportion of total enrollments from 5.9% to 12.9% in the 1973-1995 period.

## Education Completed by Ethnicity

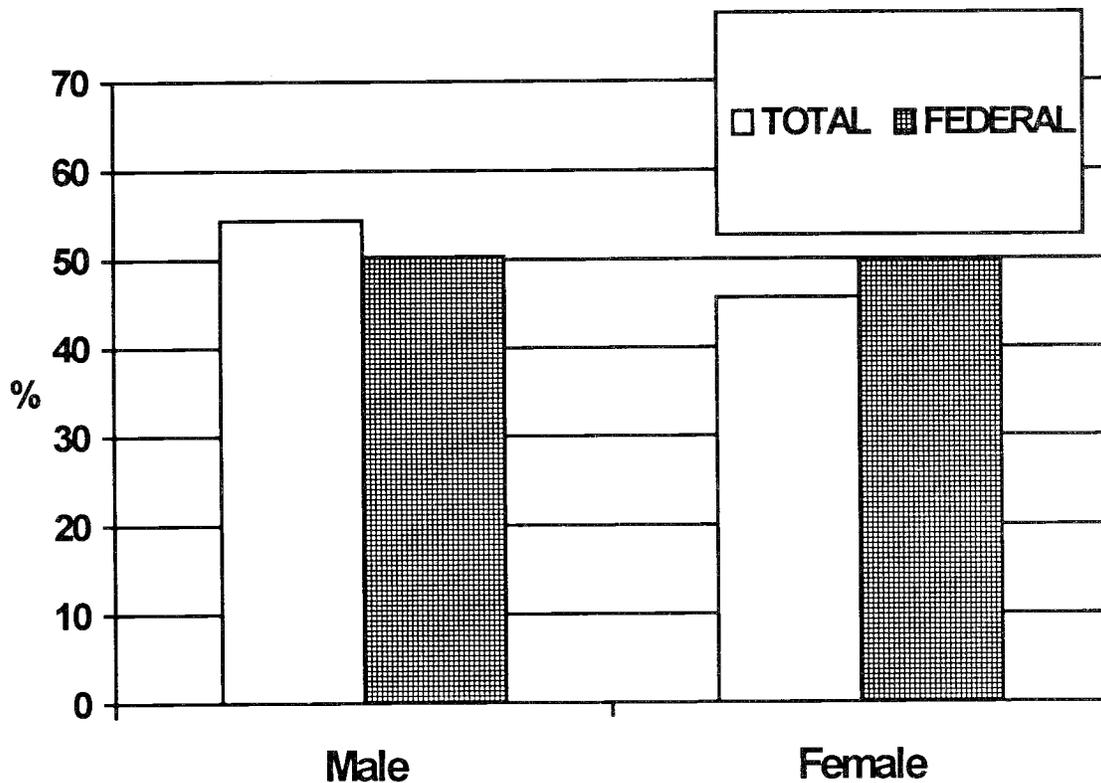


Slightly over half of all Hispanics had graduated from high school in 1992 - the lowest educational attainment level of any minority group. This educational achievement level compares with 65.6% for American Indians, 66.7% for African Americans, 77.5% for Asian Americans and 79.9% for white Americans.

At higher education levels, Asian Americans are well in front of all racial/ethnic groups, including whites. Almost 37% of Asian Americans had achieved at least a baccalaureate degree, compared to 22% of whites, and only 11.5% of African Americans, 9.7% of Hispanics and 9.3% of American Indians.

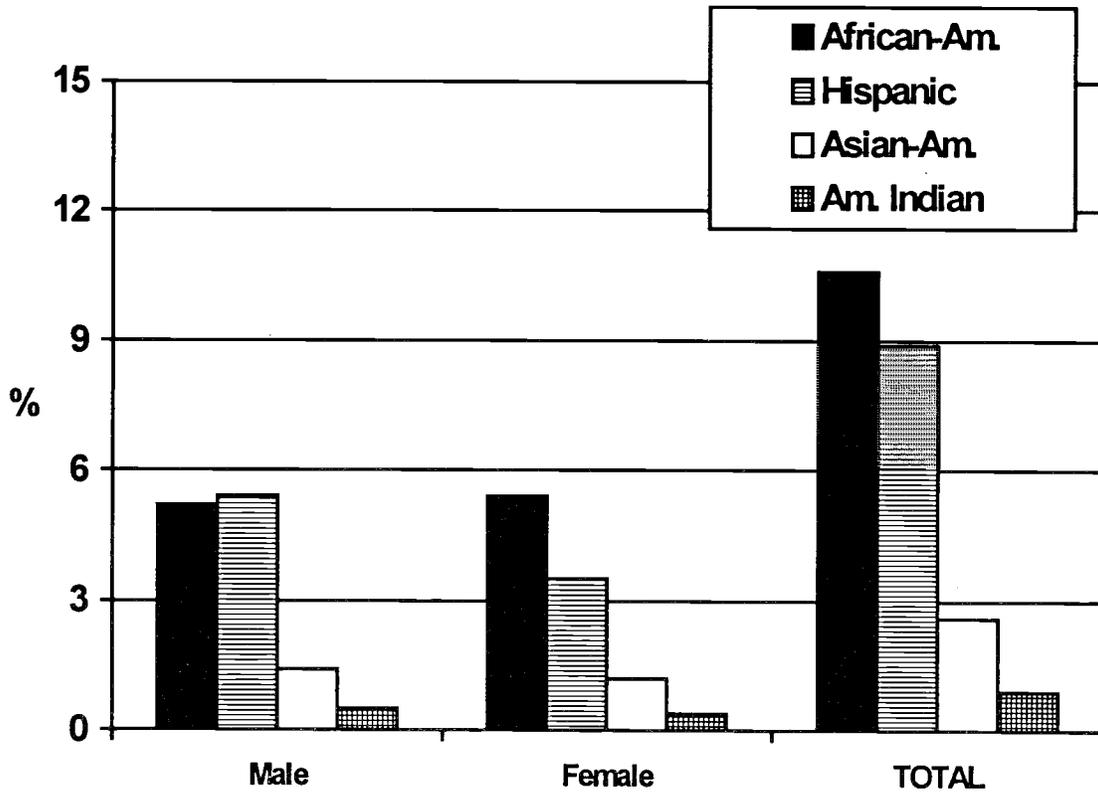
While only slightly more than 3% of Native Americans and Hispanic Americans had earned graduate or first professional degrees, almost 14% of Asian Americans had earned advanced degrees.

## WOMEN IN THE LABOR FORCE, 1994-95



Overall, as of May 1995, women were 45.6% of the U.S. civilian workforce. However, in the federal government, they are more highly represented, making up almost half (49.7%) of the total federal white-collar workers. They tend to be concentrated in the lower grades of the federal establishment.

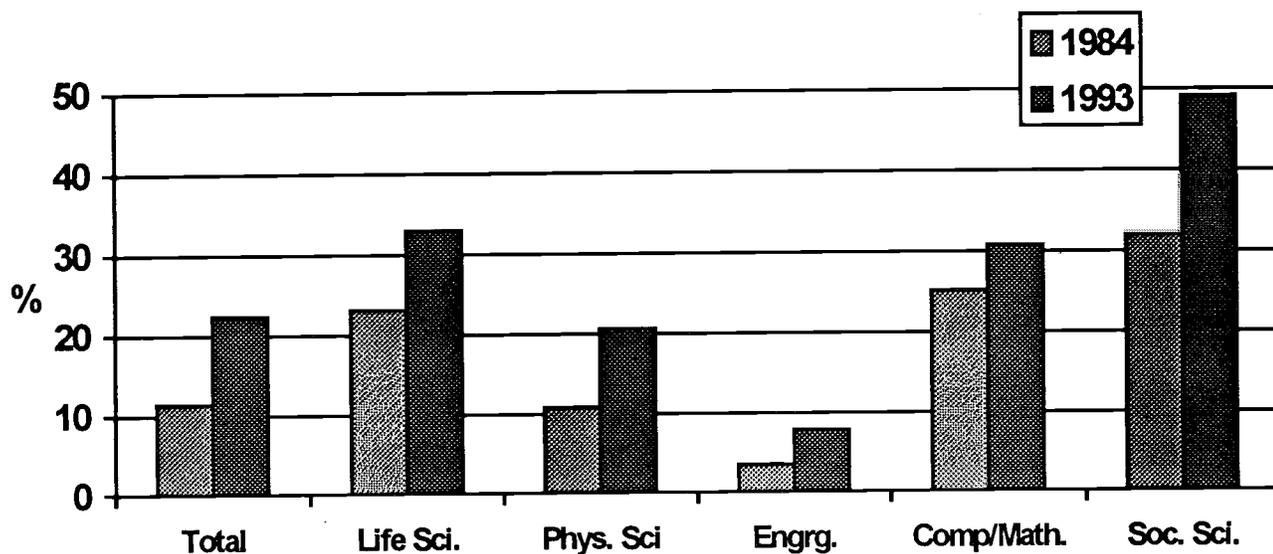
## Civilian Workforce by Ethnicity & Sex, 1992



Overall, minorities comprise 23% of the civilian workforce, which compares closely with the 25% minority representation in the population. By ethnic group, blacks comprise the largest group - 10.6% and Native Americans the smallest - less than 1%.

African Americans are the only ethnic group in which more women are in the civilian workforce than men. Overall, African Americans represent 10.6% of the civilian workforce, (5.4% women; 5.2% men).

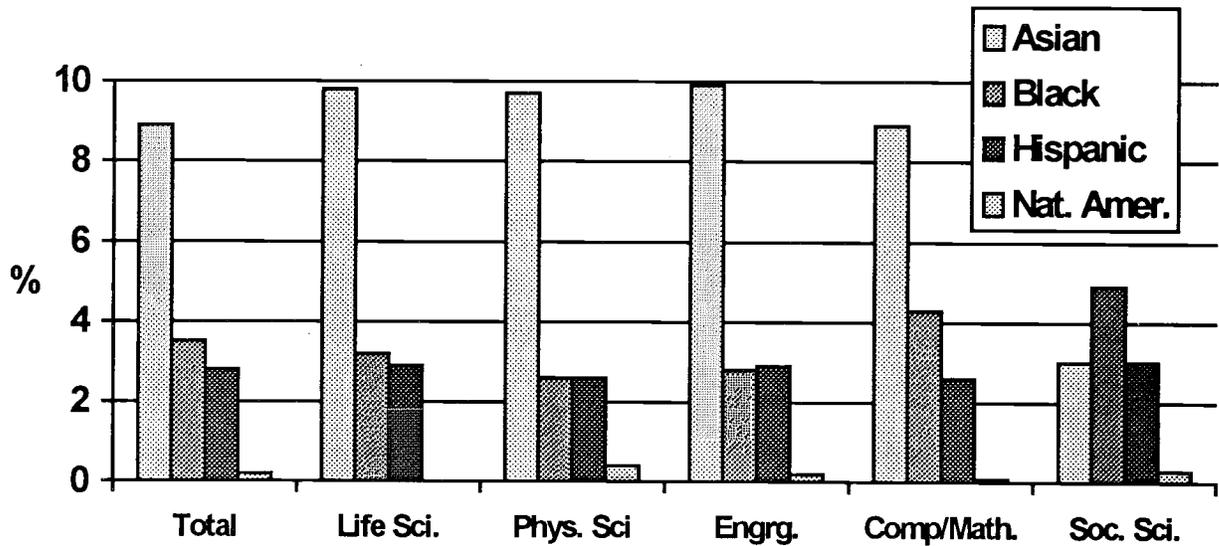
## WOMEN IN THE S & E LABOR FORCE, 1993



The number of women employed in science and engineering has nearly doubled from 1984 to 1993 - from 394,600 to 720,000. In 1993, women were 22.4% of the S&E labor force, compared to 11.4% in 1984. The greatest proportional increase occurred in engineering, where women increased their proportion from 3.4% (70,000) to 8.5% (105,000). The proportion of women employed in the physical sciences nearly doubled during the 1984-1993 period, from 10.8% (35,100) to 20.6% (55,000).

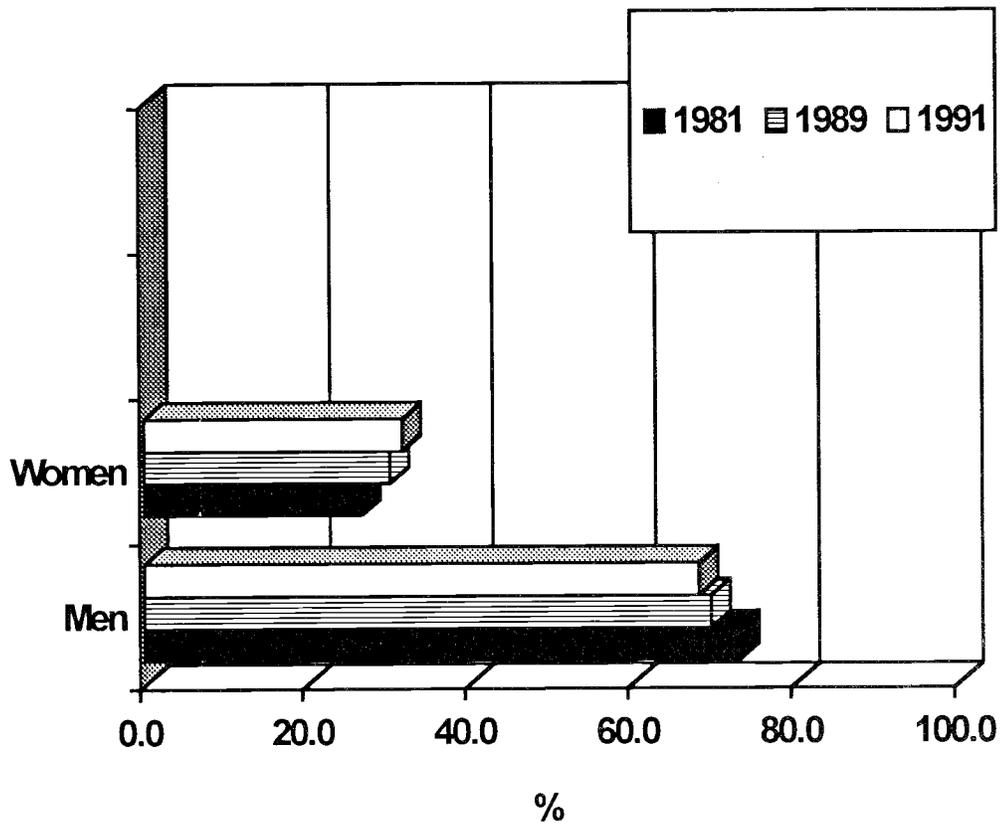
The social and behavioral sciences are the one field in which women are nearing parity with their male counterparts in labor force participation. In 1984, women represented 31.9% (113,900) of the social and behavioral scientists, and by 1994, they had increased their proportion to 49.1% (161,000).

## MINORITIES IN THE S & E LABOR FORCE, 1993



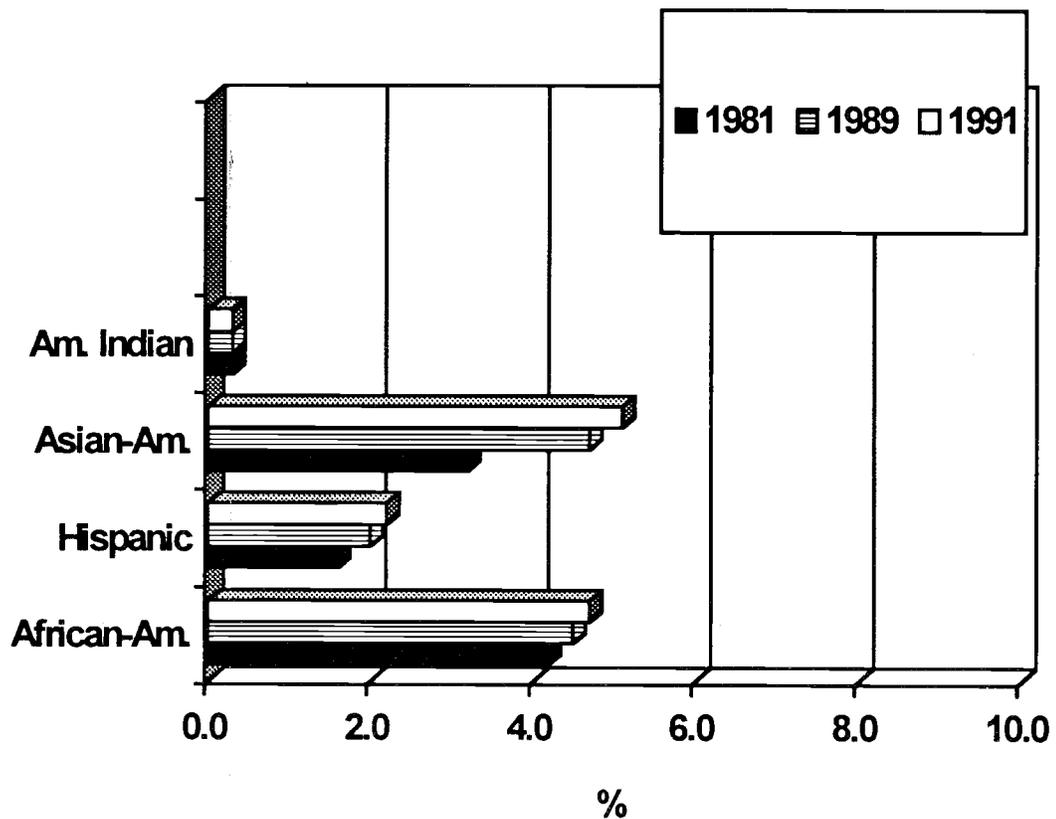
Blacks, Hispanics and American Indians represent a very small fraction of the science and engineering workforce. In 1993, there were approximately 3,211,000 scientists and engineers in the labor force. Of that total, blacks represented only 3.5% (111,000), Hispanics 2.8% (90,000), and Native Americans .2% (6,000). Asian Americans numbered 286,000 or 8.9%. These proportions vary by field. Blacks and Hispanics had the highest proportion in the social sciences, and the lowest in the physical sciences, while Asian Americans had the highest in engineering and the lowest in the social sciences.

## Full-time Faculty by Gender



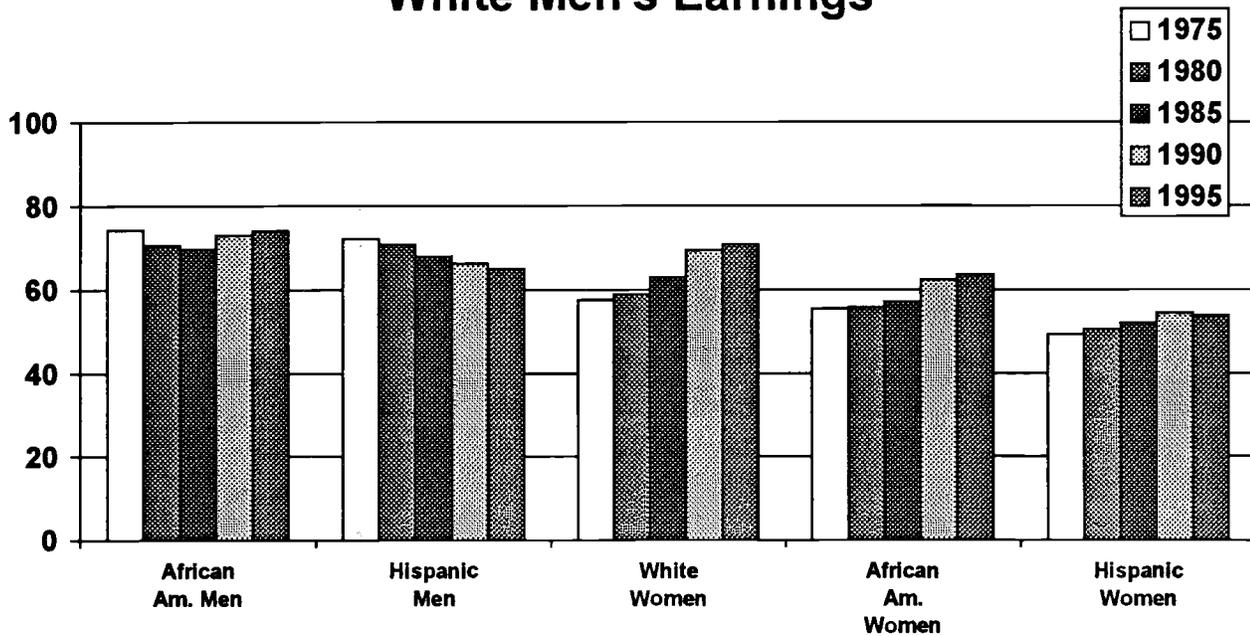
The number of full-time women faculty increased 32.2% (from 125,011 to 165,294) over the 1981-1991 period, compared to only a 3.8% increase for men from 342,203 to 355,257). Women's growth occurred at all academic ranks, ranging from 78.9% for full professor, 46.9% for associate professor, 35.1% for assistant professor, and 3.3% for instructors/lecturers. This compares to growth rates for men of 19.1%, 0.9%, and 3.1% for the ranks of professor, associate professor and assistant professor. The number of men dropped 9.2% at the instructor/lecturer rank.

## Full-time Faculty by Ethnicity



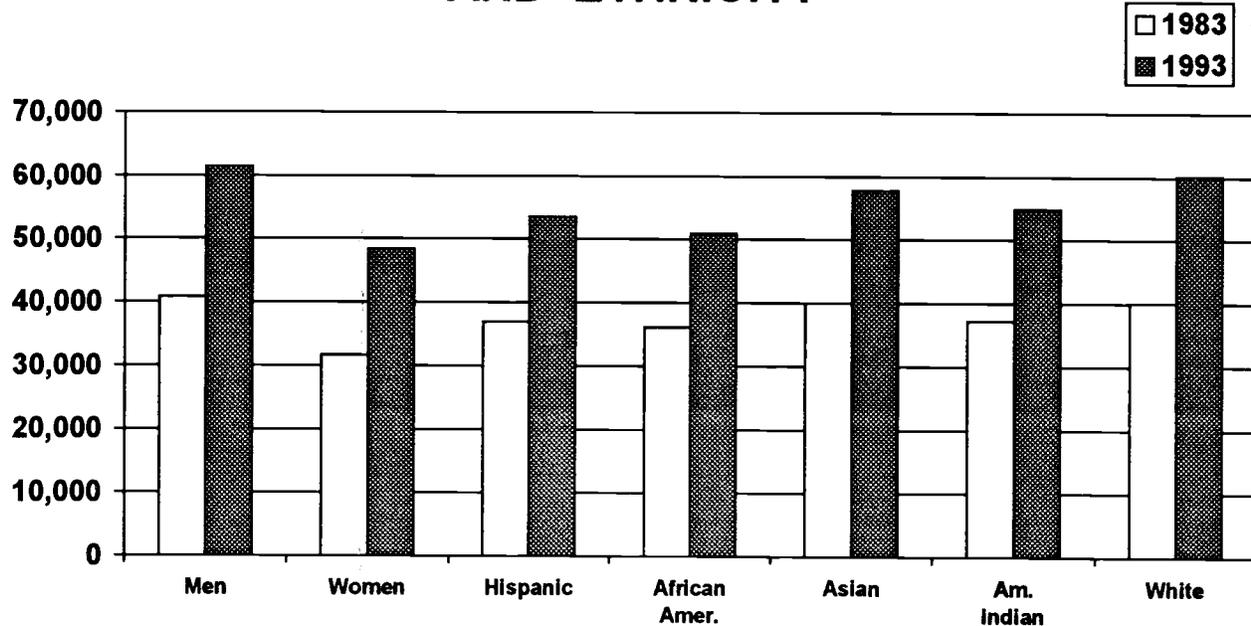
There has been progress in the representation of minorities on higher education faculties. From 1981 to 1991, the number of full-time faculty increased 11.4% (from 467,304 to 520,551). During this same time period, the number of African American faculty grew 25.1% (from 19,668 to 24,611), increasing their proportion from 4.2% to 4.7%; the number of Hispanic faculty rose 57.6% (from 7,247 to 11,424), increasing their proportion from 1.6% to 2.8%; while Asian American faculty jumped 78.3% (from 14,887 to 26,545), increasing their proportion from 3.2% to 4.8%. While American Indians increased their number of faculty positions 15.7% (from 1,431 to 1,655), proportionally, there was no progress. During this same time period, the number of white faculty grew only 7.6% , (from 424,071 to 456,316), resulting in a decreasing proportion, from 90.7% to 87.1%.

## Earnings of Women & Minorities as % of White Men's Earnings



In the total labor force, black men come the closest to matching the median annual earnings of white men - 74.0%. However, this is a slight drop from the 74.3% proportion they had in 1975. The largest salary discrepancy exists between white men and Hispanic women - where in 1994, Hispanic women earned slightly more than half (53.9%) of the salary of white men.

## SALARIES OF PhD S&Es BY GENDER AND ETHNICITY



Salaries are dependent upon a number of variables, including field, years of experience, type of employer, work activity and geographic location. These variables account for much, but not all, of the difference between the salaries of doctoral scientists and engineers by gender and ethnicity. Overall, salaries of doctoral scientists and engineers increased 49.6% over the 1983-1993 decade. There were differences by gender and ethnicity. Salaries for women doctoral scientists and engineers increased slightly more than did those for their male colleagues over the ten-year period. However, women still earn only 78.7% of what men do. African American PhDs experienced the smallest percentage increase over the 1983-1993 decade - 37.8% and American Indians the largest - 51.9%.

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