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Recasting Title IX: Addressing Gender Equity in the Science, Technology, Engineering, and Mathematics Professoriate

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Abstract

Questions of gender equity and the underrepresentation of women in the science, technology, engineering, and mathematics (STEM) professoriate in U.S. institutions of higher education have become central issues in debates on the role and makeup of the STEM workforce in today's innovation-driven economy. In response, policy makers, advocacy groups, academics, and other stakeholders have called for the dedicated enforcement of Title IX of the Education Amendments of 1972 as a tool for combating gender inequities in the academic workforce. Although previously applied primarily to gender bias in athletic programs and participation, Title IX was created to address myriad aspects of gender equity in educational institutions and, as such, currently is being invoked in the realm of STEM academic employment. Accordingly, we analyze Title IX relative to categories of potential regulatory development in light of the policy environment and related dynamics. Providing an historical overview of Title IX and its associated regulations as background, we characterize and delineate its relevance to gender disparities in the STEM professoriate, identifying areas for policy consideration and future application.

KEY WORDS: Title IX, science and technology faculty, higher education, gender discrimination

In today's ever-intensifying innovation-driven economy, science, technology, engineering, and mathematics (STEM) fields play a crucial role within any country seeking to ensure competitiveness and market viability. Developing a vibrant STEM workforce and maximizing its potential in such an environment invoke myriad related policy issues, often involving questions about the profile and nature of that workforce. In the United States and elsewhere, many of these questions are concerned with notions of gender equity and the underrepresentation of women. Academia in particular has been identified as remiss in this area, with evidence showing rampant gender disparities in the STEM professoriate despite increasing female doctorate attainment (NAS, 2007). Moreover, studies on faculty attrition suggest that while both males and females are equally committed to academic careers, women's higher turnover has been highly correlated with dissatisfaction and lower levels of research support, fewer advancement opportunities, intellectual constraints, and heavier teaching and service workloads (August, 2006; Rosser, 2004; Xu, 2008). In fact, despite initial indications of desire and plans to pursue academic careers, STEM women are increasingly less likely to do so at all (NRC, 2009; NSF, 2004, 2009).[1] Even in STEM fields where women have reached parity or

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near parity with men in doctorate attainment (e.g., biology and geological sciences), they are markedly absent as one progresses up the faculty tenure ladder.

This state of affairs brings us to a point where a focus on the U.S. policy environment reveals growing attention to issues of STEM women in the academic workforce. Indeed, this topic has engendered a variety of debates and holds a place of growing prominence (and controversy) on the public agenda, with leading government officials and academic and other stakeholders calling for regulatory action and programmatic responses aimed at addressing gender inequities and effecting institutional transformation (Hopewell, McNeely, Kuiler, & Hahm, 2009; Monosson, 2008; Sevo, 2008). At center stage in this situation is Title IX of the Education Amendments of 1972, the leading legislative tool for remedying gender inequity in higher education (see APA, 2009). Indeed, with the support of a wide variety of other players, the enforcement of Title IX has been called for by the current administration, and the executive budget explicitly provides for an increase in funding to improve Title IX implementation, reflecting campaign promises to remedy the negligence of the previous administration in this area (APA, 2009; Obama, 2008; Sander, 2009; White House, 2009). Accordingly, Title IX is the focus of the inquiry presented here, examining the policy movement relative to women in the STEM professoriate today.

To that end, after first providing a brief overview of Title IX and its associated regulations as background, we characterize and delineate the application of Title IX to the STEM professoriate by principal issue categories for framing policy initiatives that rest on Title IX in the academic STEM employment context. Our analysis turns on an investigation of the legislative and political history of Title IX enforcement policy and litigation, related content in the law itself, as well as larger concerns of employment discrimination. Focusing on applications to the specified issue categories, we then discuss the larger policy environment, including social and political support for Title IX enforcement relative to concerns of gender discrimination in academia in specific reference to women in the STEM academic workforce. We conclude by opening a dialogue on the implications and likelihood of success for Title IX as a policy tool for diminishing gender bias in the STEM professoriate.

Historical Background

Title IX of the Education Amendments—also known as the Patsy T. Mink Equal Opportunity in Education Act, in honor of its principal drafter and champion, the late congressional representative Patsy Takemoto Mink (D-HI)—was signed into law in 1972. In short, the Act provides that:

> No person in the United States shall, on the basis of sex, be excluded from participation in, be denied the benefits of, or be subjected to discrimination under any education program or activity receiving Federal financial assistance. (34 CFR 106.51(a)(1))

That is, Title IX bans gender discrimination in educational institutions that receive federal funds, including elementary and secondary schools, laboratories, museums, and colleges and universities, which are our primary concern here. Exempted entities include, for example, religious organizations whose tenets would be violated by enforcement of the Act, public institutions of undergraduate educa-

tion which from their inception have been single-sex, social fraternities, sororities, and voluntary service organizations such as Boy Scouts. In terms of the fundamental mechanics of Title IX application, the law requires that affected institutions designate a Title IX coordinator to oversee compliance efforts and investigate claims of discrimination in educational programs. In addition, it requires that as a condition for receiving federal funds, either with the application or at the award stage, an institution provide written assurance that it will comply with Title IX. Also, it must adopt and publish grievance procedures for employees and students who allege violation(s) of Title IX.

Despite the fact that Title IX applies across a variety areas of education, such as scholarship provision, access to classrooms, and employment, many believe its purview is exclusive to gender equity in sports. Indeed, such a perception is not unreasonable, considering the extensive litigation and media coverage concerning the Act since its creation. Although the issue of discrimination in athletics was barely mentioned during debates on the act, athletics have dominated policy action and the courts since implementing regulations were put in place in 1975. While developing the draft regulations implementing the Act, the Department of Health, Education and Welfare (HEW) received such a large number of comments regarding athletics that then secretary of the department, Caspar Weinberger, mused he had no idea that the most pressing issue in education was the preservation of football (Suggs, 2006).[2] Focus on sports over other areas of education continued in 1977, when Senator Jesse Helms (R-NC) introduced a bill—which failed—to remove athletics from Title IX coverage. Thus began over 30 years of public identification, policy debates, and litigation identifying the core of Title IX with gender discrimination in athletics, and the majority of guidelines issued to aid educational institutions with Title IX compliance have been in reference to its application within the context of athletics.

Amendment via the 1987 Civil Rights Restoration Act (CRRA) expanded the Title IX protection against discrimination in educational programs to include *all* operations by an educational institution, government entity, or private employer receiving federal funds. Since Title IX's inception, the federal government had interpreted *all* operations of an educational institution receiving federal funds to be covered by Title IX. Yet in a 1984 case, prior to the CRRA's passage, the U.S. Supreme Court contradicted this government interpretation, effectively limiting Title IX coverage to specific programs or activities receiving federal funds rather than entire institutions (*Grove City College v. Bell*). Creation by law, via the CRRA, of explicit terms specifying that *all* operations of an educational institution were subject to Title IX protection was no easy task. After passage in both the House of Representatives and the Senate, the CRRA was vetoed by the president. Only after the bill went back to both houses to be approved by two-thirds vote did it become law, overcoming the veto. With CRRA's passage, students and employees across an institution became subject to Title IX coverage.

Among the earliest Title IX lawsuits coming before the U.S. Supreme Court involved the question of whether Congress intended a private right of action under the Law (*Cannon v. University of Chicago*, 1979). In ruling that a private right of action was implied in Title IX, the Court found that the remedy was necessary for protecting individual citizens from discrimination, echoing that statutory language

and interpretation from another similar civil rights law, Title VI of the Civil Rights Act of 1964, and that it was the role of the federal government, not the states, to protect against discrimination.

The Court again weighed in on the legal dynamics of Title IX and private rights of action in the 1987 case, *Franklin v. Gwinnet County Public Schools*. In *Franklin v. Gwinnet County Public Schools*, a unanimous Court decision held that an educational institution receiving federal funds could be held financially liable (not just risk having federal funding pulled by the government) in an action by a wronged individual brought to enforce Title IX. This applies whether intentional discrimination is perpetrated by employee-to-student or employee-to-employee.

Overall, however, there has been little case law based on Title IX. Policy interpretations and guidelines on the law have been issued from the Department of Education's Office of Civil Rights (OCR), again generally reflecting issues related to athletic programs and students under Title IX rather than employees.[3] The other primary categories in which OCR guidance has been issued are sexual harassment of students and student pregnancy. Hence, issues related to Title IX and gender bias in employment in higher education have received little attention from the Department of Education. The current lack of case law or policy clarification from the OCR addressing the use of Title IX in education employment highlights the need for a closer, more detailed treatment of key regulatory policy and litigation components that might be faced given calls for its application in the context surrounding Title IX enforcement within the STEM professoriate (Pieronek, 2005). The following section expands upon such issues relative to Title IX development as they relate to STEM-related employment in academia and potential legal challenges.

Title IX Issue Categories

The policy and litigation history of Title IX reveals little about its application to academic employment since, as mentioned, the focus has primarily been on institutional responsibility to students in education programs, with the majority of attention on athletics. Nevertheless, additional regulatory issues can be drawn from its history, especially when combined with common litigation challenges under other civil rights legislation, such as Title VII of the Civil Rights Act of 1964 and the Equal Pay Act, and recognized evidence of differential treatment of the sexes in STEM fields. Educational institutions receiving federal funds are legally bound by the dictates of Title IX, and it is through this relationship that it encompasses the STEM professoriate. Those obligations are outlined in regulations adopted by the Department of Education (DED). In 2000, over 20 other federal agencies that disseminate funds to education programs also adopted regulations mirroring the DED's regulatory dictates (Pieronek, 2005). Much is at stake for institutions of higher education should the current (or future) administration direct the Department of Education to focus its time and resources on Title IX compliance. Failure to comply with Title IX can present a serious threat to the financial stability of a college or university, since the federal government has the power to withdraw public financial support from an institution entirely for noncompliance. Although no tertiary institution to date has lost its federal funds due to non-compliance in

athletics, many have incurred substantial costs due to, for example, attorney's fees, damages for back pay, lost future pay, emotional distress, and other litigation-related expenses borne not only by themselves, but also by complainants.

While the bulk of Title IX's regulations have been developed in reference to the protection of students, gender bias in employment conditions also fall under its purview. Thus, faculty too are entitled to protections banning gender discrimination in employment in education programs and activities. It is this portion of Title IX that is applicable to enforcement efforts in the STEM professoriate. To repeat, the core of Title IX's employment protection is captured in the following language:

> No person shall, on the basis of sex, be excluded from participation in, be denied the benefits of, or be subjected to discrimination in employment, or recruitment, consideration, or selection thereof, whether full-time or part-time, under any education program or activity operated by a recipient which receives Federal financial assistance.

Thus, Title IX's employment protections cover every phase and nuance from pre-employment behaviors to the culture of the work environment, including promotion and demotion, termination and hiring, and compensation and resources. Indeed, the language referencing "benefits of employment" reflects an appreciation that conditions of employment include opportunities for career advancement. On that basis, Title IX includes selected regulation categories that are relevant beyond the historically vibrant arena of athletics. These regulation categories, delineated in Table 1, appear potentially to be the most fruitful sources for enhanced Title IX enforcement attention and potential litigation: recruitment and hiring, compensation and resources, pregnancy and care of dependents, sexual harassment, and the work environment. Here we examine the essential features of those regulations.

Recruitment and Hiring—Title IX prohibits discrimination on the basis of sex in the recruitment and hiring of employees. As such, it requires the recruitment of members of the discriminated sex in an effort to overcome the effects of discrimination in institutions that have been found in violation of recruitment and hiring provisions. This provision opens possibilities for affirmative action, since federal law preempts any state laws banning this kind of affirmative action by state public employers. Critics have argued that this will lead to mandatory quotas within STEM faculty (Sommers, 2009). However, this argument proves specious, since the U.S. Supreme Court has long held that mandatory quota systems in affirmative action are unconstitutional (*Gratz v. Bollinger*, 2003; *Regents of the University of California v. Bakke*, 1978).

Title IX also prohibits an institution from recruiting primarily or exclusively from sources that predetermine a narrowly defined pool of applicants representing predominantly one sex if such actions have the effect of discriminating on the basis of sex in violation of the applicable regulation. Even if notification of STEM faculty positions and recruitment efforts are cast broadly, an institution should be aware of any past patterns of drawing its final pools from sources providing and/or advocating a gender-proscribed candidate pool not explainable by a nondiscriminatory lack of members of one sex in their doctoral programs. A hiring institution would not be liable for having only a small pool of applicants representing one sex when

Table 1. Selected Title IX Regulation Issue Categories

Regulation Category	Associated Regulatory Language
Recruitment	A recipient shall not discriminate on the basis of sex in the recruitment and hiring of employees. Where a recipient has been found to be presently discriminating on the basis of sex in the recruitment or hiring of employees, or has been found to have in the past so discriminated, the recipient shall recruit members of the sex so discriminated against so as to overcome the effects of such past or present discrimination. 34 CFR 106.53 (a) *Recruitment patterns*. A recipient shall not recruit primarily or exclusively at entities which furnish as applicants only or predominantly members of one sex if such actions have the effect of discriminating on the basis of sex in violation of this subpart. 34 CFR 106.53 (b)
Hiring, promotion, etc.	A recipient shall make all employment decisions in any education program or activity operated by such recipient in a nondiscriminatory manner and shall not limit, segregate, or classify applicants or employees in any way which could adversely affect any applicant's or employee's employment opportunities or status because of sex. 34 CFR 106.51 (a)(2)
Compensation	A recipient shall not make or enforce any policy or practice which, on the basis of sex: (a) Makes distinctions in rates of pay or other compensation; (b) Results in the payment of wages to employees of one sex at a rate less than that paid to employees of the opposite sex for equal work on jobs the performance of which requires equal skill, effort, and responsibility, and which are performed under similar working conditions. 34 CFR 106.54(a)(b)
Pregnancy and care of dependents	The provisions of this subpart apply to granting and return from leaves of absence, leave for pregnancy, childbirth, false pregnancy, termination of pregnancy, leave for persons of either sex to care for children or dependents, or any other leave. 106.51(b)(6) Also, (a) General. A recipient shall not apply any policy or take any employment action: (1) Concerning the potential marital, parental, or family status of an employee or applicant for employment which treats persons differently on the basis of sex; or (2) Which is based upon whether an employee or applicant for employment is the head of household or principal wage earner in such employee's or applicant's family unit. (b) *Pregnancy.* A recipient shall not discriminate against or exclude from employment any employee or applicant for employment on the basis of pregnancy, childbirth, false pregnancy, termination of pregnancy, or recovery therefrom. (c) *Pregnancy as a temporary disability.* A recipient shall treat pregnancy, childbirth, false pregnancy, termination of pregnancy, and recovery therefrom and any temporary disability resulting therefrom as any other temporary disability for all job related purposes, including commencement, duration and extensions of leave, payment of disability income, accrual of seniority and any other benefit or service, and reinstatement, and under any fringe benefit offered to employees by virtue of employment. (d) *Pregnancy leave*. In the case of a recipient which does not maintain a leave policy for its employees, or in the case of an employee with insufficient leave or accrued employment time to qualify for leave under such a policy, a recipient shall treat pregnancy, childbirth, false pregnancy, termination of pregnancy and recovery therefrom as a justification for a leave of absence without pay for a reasonable period of time, at the conclusion of which the employee shall be reinstated to the status which she held when the leave began or to a comparable position, without decrease in rate of compensation or loss of promotional opportunities, or any other right or privilege of employment. 34 CFR 106.57 et seq.
Work environment/ support	No person shall, on the basis of sex, be excluded from participation in, be denied the benefits of, or be subjected to discrimination in employment, or recruitment, consideration, or selection thereof, whether full-time or part-time, under any education program or activity operated by a recipient which receives Federal financial assistance. 106.51(a)(1) The provisions of this subpart apply to selection and financial support for training, including apprenticeship, professional meetings, conferences, and other related activities, selection for tuition assistance, selection for sabbaticals and leaves of absence to pursue training. 34 CFR 106.51(b)(8) Also, The provisions of this subpart apply to employer-sponsored activities, including those that are social or recreational. 34 CFR 106.51(b)(9)
Sexual harassment	No person shall, on the basis of sex, be excluded from participation in, be denied the benefits of, or be subjected to discrimination in employment, or recruitment, consideration, or selection thereof, whether full-time or part-time, under any education program or activity operated by a recipient which receives Federal financial assistance. 106.51(a)(1) Also, The provisions of this subpart apply to any other term, condition, or privilege of employment. 34 CFR 106.51(b)(10)

the disproportionality is related to a true dearth of candidates, not an institution's own discrimination. Nevertheless, close examination by the federal government of a Title IX institution in this area could be a policy focus in light of growing evidence that many women are deterred from academic employment and choose the often higher salaries and occasionally more flexible options for career advancement in the private sector. As one female STEM professional stated, "nearing completion of my doctorate, I reflected on personal experiences and observations of both my university and the private sector and noted that, if I were going to have to deal with a working environment that clearly treated women as second class citizens, I might as well make a higher salary with a corporation in the private sector."[4] Note that it is not that the private sector is free of discrimination; rather; it provides a rational choice for graduating female STEM doctoral students given relative career conditions.

Compensation—Compensation is another potential category where future enhanced enforcement of Title IX may evidence violations, and, hence, result in federal penalties or litigation. A clear violation involves discrimination where employees of one sex are paid at a rate less than that paid to employees of the opposite sex for equal work on jobs the performance of which requires comparable qualifications and skill, effort, and responsibility, and which are performed under similar working conditions. Even in the 21st century, women faculty members are generally paid less, promoted more slowly, receive fewer honors, and hold fewer leadership positions than their male counterparts, discrepancies that do not appear to be based on productivity or any other objective performance measures (NAS, 2007, 2009).

Relatedly, litigation and federal penalties against certain institutions are likely to arise in the STEM faculty context, where one sex is paid lower wages (salary) linked to pressures to devote extra time to nonrewarded (typically teaching and service) activities than members of the other sex. Mounting evidence indicates this is a widespread phenomenon, manifesting throughout the careers of faculty women and translating into less time available for them to devote to professionally rewarded areas such as research and publication, with negative consequences for career advancement (NAS, 2007, 2009).

Pregnancy and Care of Dependents—Discrimination in employment against those who may have children, are pregnant, or care for other dependents continues as an area in which women are particularly at risk relative to men. Some universities have attempted to accommodate the realities and time-consuming nature of caregiving on faculty employees by providing opportunities to modify the tenure clock, a procedure provided for in the Title IX regulations. While viewed by many as evidence of institutional flexibility in helping such employees achieve tenure, in reality, not all departments or institutions with such policies actually administer them without penalizing those who utilize them. For example, in a recent University of Michigan study, some women reported that their departments had a history of using the policy against those who invoked it (August, 2006), a story which is repeated in different institutions. Any federal effort to dedicate more attention and resources to Title IX enforcement is likely to reflect a concern for institutional behaviors disproportionately affecting one sex. The recognition of the time and

resources necessary for primary caregiving, the reality that it is disproportionately the responsibility of one sex, and its relationship with work environments traditionally structured in favor of nonprimary caregivers is already a topic on the policy agenda. Accordingly, any enhanced efforts would likely reflect a deeper examination into institutional work environments according to Title IX compliance mandates.

Sexual Harassment—Sexual harassment remains a problem across all employment sectors. Indeed, the number of complaints and lawsuits across the country are most likely an extremely small percentage of the actual incidents. A serious problem faced by many women in STEM fields is a hostile research environment (MIT, 1999; NAS, 2007). In one study, for example, 70 percent of female faculty in academic medicine reported gender-based discrimination and sexual harassment (Carr, Szalacha, Barnett, Caswell, & Inui, 2003). Without the pressure of legislative and policy deterrents, such as Title IX enforcement, colleges and universities, as do other organizations, might dismiss, ignore, or actually hide sexual harassment complaints so that they do not interfere with their credibility or reputation (Sekreta, 2006).

The U.S. Supreme Court has held that the sexual discrimination banned in Title IX includes sexual harassment involving two general scenarios. The first, termed quid pro quo, involves an employee being forced to decide between losing a job or job benefits in the face of a supervisor's sexual demands. The second involves sexual discrimination linked with working in a hostile environment, as discussed above. A hostile working environment is one where sexually harassing activity is not isolated; rather, it is pervasive or severe and creates an intimidating or abusive workplace (see *Clark County v. Breeden*, 2001; *Faragher v. Boca Raton*, 1998). Harassing activity may include behaviors such as making offensive comments about body parts or clothing, offensive touching, sexual or lewd jokes, derogatory comments or jokes about either sex, and so on (EEOC, 2009).

Most of the Title IX litigation and complaints dealing with sexual harassment have involved either student-to-student or employee-to-student harassment. Nevertheless, should a STEM faculty member choose to challenge an institution for sexual harassment, the complainant will need to show that he/she provided notice to an appropriate authority and that the authority acted with deliberate indifference toward the harasser, otherwise the institution would not be held liable (*Gebser v. Lago Vista Independent School District*, 1998).

The Work Environment—Title IX and its regulations reflect a concern for protecting the benefits of employment in an educational institution. Thus, we see recognition that extends beyond a literal applied interpretation of "benefits" (e.g., health insurance), a recognition reiterated in subsequent provisions that, for example, protect an individual from discrimination that hinders his or her abilities for career advancement. For STEM faculty, this might involve, for example, limited access to laboratory space, inadequate equipment, poor office space, unequal teaching responsibilities and mentoring activities, and other inequities.

Also, a department or some other university unit might sponsor activities that provide opportunities for networking or other career enhancements, although they

may or may not be advertised as such. Nevertheless, these activities can be interpreted as employment benefits, and, following Title IX provisions, cannot be sexually exclusionary. Consequently, this is another area where Title IX violations may occur, thus requiring policy attention or modification relative to symbolic and practical applications. Related Title IX protections provide that employers shall not classify a job on the basis of sex or maintain separate lines of progression or tenure systems for the sexes unless differential treatment of this nature is related to a bona fide occupational qualification. Differential treatment may be considered as reflecting a bona fide occupational qualification if it is related to the successful operation of the employment function concerned. It is doubtful that there would be a case in which maintaining separate promotion lines for males and females on STEM faculties would be related to bona fide occupational qualifications and thereby sustain a challenge.

In addition, Title IX holds that a recipient shall make all employment decisions in its education programs or activities in a nondiscriminatory manner, and shall not limit, segregate, or classify applicants or employees in any way that could adversely affect their employment opportunities or status because of sex. Current evidence indicates that it is not unusual for female STEM faculty members to be given responsibilities that hinder their advancement, responsibilities that are not assigned to males in the same proportions (Fogg, 2004; GAO, 2004; MIT, 1999). For example, requiring a heavier teaching load or increased committee participation of women, or assigning them additional student advising responsibilities, or plying them with other types of additional service work are all features and activities that infringe upon research and publication priorities that are emphasized for STEM faculty career advancement. An institution may attempt to defend itself by claiming, for example, that all such work is "voluntary," but a question arises in the definition of "voluntary" in practice and application. Are males and females presented with "voluntary" work evenly? Do individuals who say "no" to such voluntary "opportunities" experience negative repercussions for that response?

Policy Dynamics

Current policy initiatives calling for the dedicated use of Title IX to address inequities in the STEM academic workforce reflect a merger of policy makers, academics, and various other interest groups who have argued related issues since the late 1990s. For example, the American Association of University Women, the Society of Women Engineers, the Association for Women in Science, and the National Women's Law Center, to name only a few, have all called for Title IX enforcement in STEM for several years. Expanded publication of data verifying gender inequity in higher education employment and associated action by advocacy organizations and policy makers reflect a 360-degree chronology of debates that started in earnest during the 1960s and early 1970s, with increased attention to civil rights, social justice, and the women's movement in the United States. During that time, a number of advocacy organizations such as the Women's Equity Action League instituted litigation arguing widespread discrimination against women at colleges and universities across the United States, including complaints concerning discrimination against employees at educational institutions receiving federal funds (Sandler, 1970). Their efforts

harmonized with those of leading policy makers who identified discrimination in education as a nationwide pervasive problem involving not only students, but also faculty hiring and promotion, professional staffing, and pay scales.

While most Title IX policy activity in the 1990s continued to reflect the historical preoccupation with athletic programs, a few efforts by the executive branch represented some attempts to address gender discrimination in education programs not related to athletics. For example, the Office of Civil Rights of the Department of Education issued guidelines for schools in identifying, preventing, and addressing sexual harassment in conjunction with Title IX's mandates (OCR, 1997). In addition, then President Clinton instructed all federal departments and agencies to mirror Title IX protection for educational programs and activities conducted by them (not required under the Act), and to develop new and vigorous Title IX enforcement plans to ensure entities receiving federal funds via individual agencies were Title IX compliant (Executive Order No. 13,160, 2000; Clinton, 1997). The latter initiative formed the basis for the eventual final common rule issued by the Department of Justice in 2000 covering over 20 departments and agencies.[5]

However, Title IX enforcement and related initiatives aimed at equity in education hit profound obstacles via Congress throughout the 1990s. Despite the Clinton administration's efforts on behalf of Title IX beyond athletics and support from a small number of federal policy makers, congressional setbacks were the tone of the day. In 1996, Congress cut or eliminated funding for state Title IX coordinators, and in 2003, cut funding for the Women's Educational Equity Act (1965), also introduced by Patsy Mink, which provided grants to aid in promoting gender equity in educational environments and funding to aid institutions in meeting Title IX requirements.

With the new millennium, research documenting evidence of discrimination against women in STEM fields revealed the magnitude of the problem.[6] The publication of such research occurred almost in concert with mounting concerns by leading policy makers that the United States was losing its competitive edge in the global economy and associated national security issues (USCNS, 2001). Further discussing these issues, in a 2002 hearing of the Senate Commerce Committee's Subcommittee on Science, Technology, and Space, some policy makers expressed concern that educational institutions were continuing to treat women in the sciences as second-class citizens, and that it was imperative that Title IX be fully enforced to ensure equal opportunity for women in the STEM fields (Wyden, 2002). The Subcommittee subsequently ordered a General Accountability Office (GAO) investigation into federal agency efforts to enforce Title IX requirements in federally funded programs. With billions of federal dollars spent on scientific research and development activities, the senators were interested in knowing how agencies providing such funds were monitoring grantees for Title IX compliance. The investigation revealed, among other conditions, little or no monitoring by each of the agencies; the Department of Education, charged with administering Title IX, provided sporadic monitoring, which was the best of all studied agencies (GAO, 2004). Moreover, other research documenting widespread discrimination in the STEM academic arena was increasing, indicating gender biases preventing women in science and related fields from being hired or advancing in faculty positions (NAS, 2007).

Similarly, many of the arguments used to justify discrimination against women in athletics are also seen in the STEM context—e.g., women are not as interested in science as men, or that they do not have the predisposition for sports or science—although empirical evidence flatly refutes them. For example, a common argument posits that women are not interested in careers requiring long preparation and demanding work pressures, yet women are graduating from medical school at rates approaching parity (Sevo, 2008). Undoubtedly, with such strong tendencies toward negative gender stereotyping, vigorous Title IX enforcement in STEM will require well-trained compliance coordinators at both the state level and institutional level, and the retraction of previous cuts by Congress in funding for state Title IX coordinators.

In addition, while federal grant recipients must file Title IX assurances of compliance, little data currently exists on gender-related conditions in STEM research supported by federal monies. Accordingly, an enhanced Title IX enforcement policy would include the coordinated and uniform collection of data on gender participation and conditions among STEM faculty.

Employee Costs and Litigation Choices—As might women in other fields and employment sectors, STEM women in higher education may feel silenced by hostile environments due to fear of retaliation—retaliation that can end a career (Rolison, 2000). To remedy this situation, Title IX enforcement actions need to be publicly prominent, clear, and effective. In addition, further Department of Education guidance emphasizing that Title IX not only protects those directly wronged by related violations, but also those who protest such actions and later experience employer retaliation. It has only been through court interpretation in recent years that protection from retaliation has been attached to Title IX for those voicing concerns or filing complaints.

In terms of pursuing a violation of Title IX, an employee has a number of choices, all of which may produce considerable personal or financial burdens. While filing a complaint with one's institution or with the Equal Employment Opportunity Commission may not reflect the high financial cost of pursuing a civil lawsuit or entail the same extensive time requirements, entering into litigation can prove tremendously expensive, as well as time consuming. Also, bringing civil lawsuits involves a greater burden of proof than filing a complaint with an institution, since proof that the institution had actual knowledge of the discrimination (e.g., sexual harassment) is required if seeking financial remuneration for damages. Nevertheless, the legal environment is experiencing an increased willingness of aggrieved employees to challenge discriminatory treatment by an educational institution (Colb, 2007).

This is particularly the case since the recent U.S. Supreme Court interpretation of Title IX as also protecting those who protest discriminatory behavior—whistleblowers—though such employees did not directly experience it. In *Jackson v. Birmingham Board of Education* (2005), the Supreme Court ruled that individuals who protest sex discrimination even when not the direct targets of it, can seek damages if their colleges or schools retaliate against them for invoking Title IX. Damages can include recompense for past and future economic losses, as well as emotional distress. Since this case, juries have returned multi-million dollar judg-

ments in favor of women and athletic program administrators who showed evidence of retaliation for expressing concerns about discrimination against female athletes and athletic programs. For example, a California jury awarded Lindy Vivas, a former Fresno State University women's volleyball coach, $5.85 million dollars supporting her Title IX retaliation claim (Porto, 2008).[7] The award, which included compensation for back pay, future lost wages, and emotional distress, was nearly $2 million more than she had requested of the jury. Another Fresno State coach and athletics administrator brought a similar retaliation suit and collected $3.5 million as part of a settlement with the university (Redden, 2007). Although the Fresno State cases are among a small number reflecting multi-million dollar resolutions, even smaller verdicts and settlements in totality have cost universities—and taxpayers—countless millions. The *Jackson v. Birmingham Board of Education* case is a powerful cousin of *Franklin v. Gwinnet County Public Schools*, discussed previously, in allowing both those who directly experience discrimination and those who report it and are retaliated against to seek monetary damages.

Between the time Title IX's regulations were implemented in the late 1970s and the Supreme Court ruling in *Grove City v. Bell* (1984), legal challenges concerning institutional violations of Title IX, particularly in the area of athletics, were common. Until Congress passed the CRRA in 1987, such lawsuits virtually screeched to a halt due to the Court's ruling that severely limited Title IX's applicability to discriminatory behavior at educational institutions (Tungate & Orie, 1998). However, litigation rates are linked to changes in the policy environment, as evidenced by the history of Title IX challenges. Although the personal and financial costs may be high for those who challenge such discrimination, women are increasingly challenging Title IX violations, particularly since the *Jackson v. Birmingham Board of Education* case, and those who cannot afford the costs of litigation are actively seeking pro bono representation by advocacy groups such as the National Women's Law Center (2009). Consequently, reflecting lessons learned from these cases, a conspicuous and well-articulated federal initiative on Title IX enforcement in the STEM context could produce institutional and program level changes as education employers seek to avoid litigation.

Administration and Oversight—Title IX requires that institutions receiving federal funds provide assurance of Title IX compliance in activities and programs, a Title IX coordinator (an individual with responsibility for Title IX coordination at the institution), published grievance procedures, and a published policy on nondiscrimination in conjunction with Title IX. The sheer of cost of enforcement by federal level agencies such as the Department of Education have left much of the adherence to Title IX dictates to the self-management of institutions. In other words, until a complaint draws attention to an institution, the government relies upon each institution's own representations of compliance. We know that the previously mentioned MIT internal investigation, prompted by female faculty members, which revealed widespread discrimination problems based on sex, was initiated approximately two decades after Title IX's implementing regulations were passed (MIT, 1999). MIT's proactive attention at that stage was one of the first comprehensive assessments of institutional impacts on STEM women. One might consider that without the stimulus of faculty complaints with a receptive

administration or the threat of litigation, the current state of Title IX enforcement might leave STEM faculty fearing retaliation in discriminatory work environments.

In an era of Title IX enforcement with resources redirected to compliance in STEM academic employment, rather than the current requirement of a simple statement and promise of compliance to the OCR or federal-grant making agency, a more comprehensive statement concerning certain "best practices" (with linked outcomes) can lead to more effective oversight and enforcement. Thus, for example, one best practice element might reference institutional practices that pair advancement criteria (e.g., nature and quantity of research and publications) with those supportive of family life demands (e.g., tenure clock extensions). Such an approach also would have to be explicitly linked with nondiscrimination policies for those who take advantage of them. Recall that, as previously discussed, a current problem often cited by female faculty is that despite availability of tenure clock modification policies at some institutions, there is a real concern that those who avail themselves of the policy do so at their own risk (August, 2006). Hence, there is a need to link institutional policies with practices that are administered consistently without negative employment ramifications for those who use them. In addition, further clarifications may be needed to address unique aspects of gender representation in individual STEM fields.

Conclusion

No single law and its enforcement will completely rectify deeply embedded societal discrimination. However, Title IX has been called upon as at least a step in the direction of gender equity in academia—even while fundamental ideological beliefs about sex roles and abilities remain as challenges to effective implementation. Indeed, the very academic decision makers and experts who make or break academic careers, and who lived through over 30 years of Title IX and other civil rights laws, are among the carriers of associated discrimination. The marginalization of women in STEM faculty positions, particularly in respect to disparities in salary, laboratory space, resources, responses to job offers, and awards—despite comparability with male colleagues in terms of professional qualifications and accomplishments—is a clear manifestation of just this point. Thus, it is no surprise, as referenced above, that the attrition rate for women faculty in STEM fields is significantly greater than that for men. This dynamic makes for a critical situation relative to Title IX enforcement in which institutions of higher education might ultimately find it difficult to retain qualified STEM faculty. Creating equity in the academic workforce and an institutional environment in which women faculty are valued and desire to remain is central to achieving the goals of Title IX, and, more, has implications for the broader goal of maintaining a vital STEM workforce.

However, while discussions of Title IX applications to the STEM faculty and other constituents in academia have focused on fighting discrimination against women, one also must remember that the legislative language of Title IX is not limited to protections for women; it speaks to prohibiting bias "on the basis of sex." In other words, Title IX provisions can apply to men as well as women. This language takes on added significance in recognition that, given what has occurred in Title IX enforcement in athletics and employment discrimination, Title IX may

be used to foster claims of "reverse discrimination" and to affect a male re-entrenchment in STEM higher education and subvert the basic intent and goal of gender equity in the academic workforce.

Nevertheless, Title IX has been presented and interpreted as a legislative response for combating gender bias in academia, and, accordingly, the current administration has cited enforcement of Title IX as one of several tools for addressing inequity and discrimination against girls and women in science, specifically referencing extant conditions (Obama, 2008).

> Women are significantly underrepresented in the STEM workforce, and especially in the leadership positions in research and academia. We need women in leadership roles both for their contribution and for the message of encouragement and opportunity that their presence sends to our daughters.

Executive branch policy support, together with strong advocacy group action and the backing of various political leaders, academics, and other stakeholders, reflects a formidable alliance for dedicated Title IX enforcement. Along with issues of social justice and rights, with a larger policy focus on the role of the STEM workforce in an innovation-driven global economy, Title IX is being considered beyond the athletics arena; it is being recast in the role of champion of gender equity in the STEM professoriate.

Notes

1 Highly qualified women also are leaving STEM corporate employment, a phenomenon linked with hostile sexist work environments fraught with exclusionary, predatory, and isolating dynamics (Hewlett, Buck, Servon, Sosnovich, & Sumberg, 2008).
2 In 1980, Congress split HEW into the Department of Education and the Department of Health and Human Services. The Department of Education was given primary responsibility for Title IX administration and enforcement.
3 For a list of OCR publications on Title IX, see, http://www.ed.gov/about/offices/list/ocr/publications.html.
4 Anonymous, personal communication, May 17, 2009.
5 Nuclear Regulatory Commission (10 CFR Part 5); Small Business Administration (13 CFR Part 113); National Aeronautics and Space Administration (14 CFR Part 1253); Department of Commerce (15 CFR Part 8a); Department of State (22 CFR Part 146); Agency for International Development (22 CFR Part 229); Department of Housing and Urban Development (24 CFR Part 3); Department of Justice (28 CFR Part 54); Department of Labor (29 CFR Part 36); Department of the Treasury (31 CFR Part 28); Department of Defense (32 CFR Part 196).
6 For example, see references in NAS, 2007.
7 The judge later reduced this amount to $4.52 million, plus $660,000 in legal fees (Porto, 2008).

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