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Targeted Funding of Research and Education and Faculty Perception of Academic Freedom in Medical Education

A dissertation submitted in fulfillment of the requirements for the degree of
Doctor of Philosophy at Virginia Commonwealth University

by

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Abstract

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By Shelly Ann Elliott, Ph.D.

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Director: Dr. Nora Alder

This study was conducted to determine if there was a relationship between targeted funding of research and education and faculty perception of academic freedom at their medical schools. A total of 130 physician and basic sciences faculty from three medical schools assessed academic freedom at their institutions on an academic freedom inventory developed specifically for this study. The lack of a representative sample and the weak explanatory power of the findings limit conclusions that could be drawn. Using multiple regression analysis, the researcher was not able to reject the null for a relationship between targeted funding and academic freedom, using the *probability of F* statistical test ($p>0.05$). Other variables included I the study were found to be statistically significant, but the models were generalized considered weak. A statistically significant

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relationship was found for faculty, who perceived faculty governance and institutional autonomy to be inhibited at their institutions more than their administrators. Collateral track faculty perceived freedom to research to be inhibited, while women and minorities perceived freedom to speak to be inhibited. One unexpected finding was the relationship between being male and being a citizen with a perception that academic freedom was inhibited at their institutions more so than for women and faculty who were not U.S. citizens. These findings were surprising given concern raised in the literature about the treatment of foreign faculty and students after the 9-11 terrorist attacks (AAUP, 2003). Further research is recommended to determine if findings can be replicated with a reliable instrument and a representative sample.

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Chapter I. Introduction

Statement of the Problem

The medical professorate has raised concern about the effect of targeted funding by government and industry of research and education on the health of academic freedom in medical education (Conference on Academic Values in the Transformation of Academic Medicine, AAUP, 1999; Brainard, 2006; Steinman & Baron, 2007). It is thought that academic-industry relationships pose significant conflicts of interest for faculty and administrators (Dievler, 2002) and that faculty may have lost control of the research agenda (Nicholson, 1995).

The professorate also has raised concerns about pharmaceutical support of continuing medical education and medical conferences (Packer, 2005; Mangan, 2004). The drive to generate clinical revenues is thought to have created a corporate culture in medical academia, resulting in a trend away from joint decision making with faculty through traditional governance in favor of more hierarchical decision making approaches (Jones, McCullough & Richman, 2005; Conference on Academic Values in the Transformation of Academic Medicine, AAUP, 1999). Regardless of these trends, little research has been undertaken to assess faculty perception about the health of academic freedom in their medical schools.

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Background of the Problem

Academic freedom historically has been vulnerable to political interference since its origins in ancient Greece when Socrates was tried and convicted for corrupting the morals of the youth (Tredennick, 1969). Nearly 2,500 years later, special protections were still considered necessary for the professorate to challenge conventional thought without fear of reprisal when the American Association of University Professors (AAUP) issued its *1915 Declaration of Principles.* These principles provided a rationale and definition for academic freedom in America (AAUP, 2006, pp. 291-301). This was followed in 1940 by the *Statement on Academic Freedom and Tenure*, which addressed the need for faculty to have the economic protection of tenure and the right of self-governance in order to be protected from undue political interference (AAUP, 2006, pp. 3-11). Later, the AAUP issued the *1966 Statement on Government of Colleges and Universities*, which addressed the need for institutions to have autonomy in decision making (AAUP, 2006, pp. 135-140; see also AAUP, 2001; Hamilton, 2002).

Hamilton (2002) suggests that the AAUP *1915 General Declaration of Principles* remains the foundational statement defining the American concept of academic freedom. The 1915 Declaration built a definition of professional academic freedom: Professional academic freedom must enable the individual scholar to perform the three functions of: 1) dealing with sources of knowledge and reflecting upon them toward some result; 2) imparting those results to students; and 3) extending those results to the public (Hamilton, 2002).

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Historical Vulnerability

The idea that teachers and students in academia need freedom from political interference to challenge conventional beliefs is thought to originate in ancient Greece when Socrates, an ancient Greek teacher and philosopher from the 5th century B.C., was accused of, and later sentenced to death for, corrupting the minds of the young. Socrates and his students and followers questioned existing societal beliefs and values in ancient Greek society, which was met with public enmity (Fuchs, 2007; Tredennick, 1969). Socrates has been considered the hero of western rationalistic thought, which was based upon critique of any belief through logic and rationality (Searle, 1997, p. 200).

The idea of autonomy for the "community of scholars" arose in the universities of Europe during the Renaissance. Rights to freedom of thought and speech date to the Age of Enlightenment in the late 18th and early 19th century, and are also rooted in the Bill of Rights in the U.S. Constitution. The idea that the academic classroom needed protection from outside interference in order to enable teachers to teach and students to learn was bolstered in Germany during the Industrial Revolution of the 19th century (Fuchs, 1997, pp. 136-137).

America's institutions of higher education have historically experienced alternating periods of economic prosperity and adversity, and public support and denigration. In response, they have adapted to society's changing needs by reinventing themselves several times since the Colonial Period (Rudolph, 1990; Altbach, Gumport & Berdahl, 1999, p. 15). Following the American Revolution, the goal for colleges and

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universities became to prepare "young men for responsible citizenship in a republic that that must prove itself…" (Rudolph, 1990, p. 40).

The modern concept of academic freedom was born in the academic institutions of Germany during the Industrial Revolution, and it primarily focused upon the need for a student to learn and a teacher to teach, free from political interference. American higher education extended this concept beyond the classroom to encompass the pursuit of objective truth, unfettered by partisan political forces, in order to discover new scientific truths (Rudolph, 1990, pp. 412-413). The American university was shaped by the European liberal arts tradition, the German research model and the American ideal of service to the state (Altbach et al., 2001).

It was not until 1940, that the next formal statement protecting academic freedom was adopted. The *1940 Statement of Principles on Academic Freedom and Tenure* gained the endorsement of almost all scholarly societies, presidential organizations, and university and college governing boards' nationwide (Altbach, Berdahl and Gumport, 1999; DeGeorge, 1997; AAUP, 2001; AAUP, 2006, *1940 Statement of Principles on Academic Freedom and Tenure with 1970 Interpretive Comments*). The 1940 statement declares that college professors are entitled to academic freedom in three core dimensions: freedom in research and in the publication of results, freedom in the classroom in discussing their subject and when they speak or write as citizens; and freedom from institutional censorship or discipline. Each contains limits. Freedom of speech is restricted to relevancy to subject matter of the class room and freedom of research for pecuniary return should be based upon an understanding with authorities. It

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also suggests a guarantee of these same freedoms for non-tenured faculty, and provides recommendations for termination to protect faculty from unfair termination. This 1940 statement is the most widely accepted academic definition of tenure and is even accepted by the U.S. Supreme Court as an exemplar of academic freedom principles (Altbach et al., 1999; DeGeorge, 1997; AAUP, 2001; AAUP, 2006, *1940 Statement of Principles on Academic Freedom and Tenure with 1970 Interpretive Comments*).

In the *1940 Statement of Principles on Academic Freedom and Tenure,* the AAUP provides the following rationale and description for academic freedom and tenure:

> "Institutions of higher education are conducted for the common good and not to further the interest of either the individual teacher or the institution as a whole. The common good depends upon the free search for truth and its free exposition" (AAUP, 2006, *1940 Statement of Principles on Academic Freedom and Tenure with 1970 Interpretive Comments,* p. 3).

1950s Cold War.

Shortly after the AAUP developed and adopted guidelines for protecting academic freedom (Hamilton, 2002), these very procedures and policies were used to bypass and terminate faculty in the name of national security during the 1950s Cold War period (Schrecker, 1986). Sen. Joseph McCarthy led a national movement targeting certain professions, including the professorate, as potential threats to national security. During this period, national government concerns about the threat of Communism were the rationale and university administrators were the means to targeting politically liberal faculty for termination and legal action by bypassing and distorting faculty due process protections (Schrecker, 1986). The history of McCarthyism offers a historical precedent

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of university presidents and boards successfully bypassing faculty governance for political purposes during a time of national crisis. Following the aftermath of the Sept. 11, 2001, terrorist attacks on New York City (commonly referred to as 9-11), the higher education literature has suggested that government has again repressed academic freedom in the name of national security by targeting foreign students and scholars for scrutiny and denying them admittance or access to the data they need to conduct research (Monastersky, 2002; Monastersky, 2007).

1980s-21st century: Accountability Era.

Another time period thought to present challenges to academic freedom came during the 1980s and 1990s. Named the Accountability Era, sweeping changes in higher education related to funding, political oversight, curriculum, and research were implemented (D'Arms, 1999; Heller, 1996). Part of the Accountability Era involved a conservative effort to link the curriculum to educational results in order to hold institutions "accountable" for what was taught. This movement sought to change the curricular emphasis away from social sciences and multiculturalism and toward a more business-oriented type of education. The ideological right claimed that the undergraduate curriculum was lost in multiculturalism and ethnic and gender studies (Altbach et al., 2001).

Supporters of the more conservative curricular change suggested that higher education had developed curriculum of little value, abandoned the teaching mission for research, and lacked quality (D'Arms, 1999). Lynne Cheney, former head of the National Endowment for the Humanities and a conservative supporter of a classical canon,

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suggested that higher education valued the research mission over the teaching mission (Cheney, 1990).

The corporate model.

One trend related to the Accountability Era movement included efforts to make higher education more efficient by replacing faculty governance with hierarchical, top down decision making processes. The AAUP has expressed concerned about the decline of faculty involvement through self-governance since the beginning of the Accountability Era that began in the 1980s. In 1996, the AAUP convened a conference on "Shared Governance vs. Corporate Management" to discuss the health of faculty governance in America. Participants noted that leadership tended to bypass traditional faculty governance during the summer and vacation times when many faculty members were gone. Rather than consult with faculty, senior administrators would pursue other avenues of consultation, including hand-picked committees (Scott, 1996).

Trends in Funding

The economic downturn of the late 1970s brought on a movement to downsize federal government support for higher education by cost shifting to states and students or their parents. At the same time, declining enrollment from population decreases resulted in decreased tuition revenues. In response to the dual hits of decreased student enrollment and reductions in federal funding, higher education institutions increasingly relied upon tuition increases and state support to offset costs (Duderstadt, 2000; Levine, 2001; Altbach et al., 1999; Kissler, 1997). Johnstone (2001) believes there was a disconnect

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between the public perception of higher education as inefficient and bloated and the faculty/administration's perception that higher education was woefully underfunded, forced to chase external funds and in a constant search to improve efficiency and reduce costs.

Political oversight.

Another trend that emerged during the Accountability Era was the creation of external oversight committees of politically appointed members who were focused upon scrutinizing costs and curriculum, and developing quantitative means to measure the results of higher education (Heller, 1996; Kissler, 1997; D'Arms, 1999). The American Council on Education (ACE), in its *2001 Brief Guide to Higher Education,* identified increased political oversight and accountability in higher education as a national trend (ACE, 2001). The State Council of Higher Education in Virginia (SCHEV) is an example of one such oversight committee composed of members by the Governor. The role of SCHEV is to scrutinize spending, create plans for universities, and to oversee whether higher education has met its goals as set by the General Assembly (SCHEV, 2005).

Performance-based funding.

The 1990s also saw the introduction of performance-based funding (or funding based upon educational outcomes) in Virginia. In 1990, State Council for Higher Education in Virginia (SCHEV) submitted a "first in the nation" proposal to the General Assembly requiring that college funding be dependent upon student performance. Those opposing the proposal in the General Assembly said it needlessly interfered with the

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state's system of higher education. The proposal was defeated by the General of Assembly (Hardy, 1990; SCHEV, 2005).

Some policy analysts and public college officials have suggested that the practice of tying funding to performance had been largely unsuccessful. Members of a conference on performance-based financing held in 2002 suggested that most of the systems served only to produce little more than additional paperwork and needless controversy (Schmidt, 2002).

Congressional earmarking of research.

While simultaneously attempting to control higher education by instituting performance-based funding initiatives, the 1980s also ushered in a trend in federal government line item appropriations tied to specific research. This was thought to be a response to public demand for quicker research results to meet pressing societal health care needs. The practice of congressional earmarking was accompanied by a decrease in basic research funding, which traditionally had been driven more by faculty interests than by corporate interests or a government agenda (Rhodes & Slaughter, 1997).

Academic capitalism.

Rhoades and Slaughter (1997) identified the movement in academia away from basic research and toward applied and entrepreneurial science in order to generate revenues, such as from the creation of research parks and technology transfer offices. The authors termed this trend academic capitalism, or a movement away from general government funding and toward higher tuition, more competitive grants and contracts, academic-corporate partnerships, and more solicitation of private gifts and other non-

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public monies (Rhoades & Slaughter, 1997). In response, Mangan (2004) noted that medical faculty have expressed concern about the intrusiveness of pharmaceutical and other scientific companies that support costs of continuing medical education or education within teaching hospitals (Mangan, 2004).

The 21st Century

To date, the 21st century has seen a continuation and extension of the same trends from the Accountability Era (Zernike, 2002), as well as new potential threats to academic freedom such as attempts to control or change the political composition of the faculty and government interference in the name of national security interests. Zernike (2002) suggests that the Accountability Era, with its emphasis on oversight and quantifiable measurement of education results, might have permanently changed the fundamental purpose of higher education.

Presidency.

The need for institutions to pursue new sources of funding is thought to have permanently changed the role of the university president (Cook, 1997). Rudolph (1999) notes that the university or college president of the early part of the 20th century was both an administrator and academic leader. Cook (1997) believes that the major role of the President of the late 20th century and early 21st century is less a leader of scholars and more likely that of a fund raiser (Cook, 1997).

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Faculty.

The American Council on Education (ACE) reported that the presence of part-time and full-time, non-tenure track faculty on campuses grew significantly during the past two decades. As enrollment increased and funding decreased, administrators sought ways to control costs: hiring part-time or non-tenure track faculty helped to off set rising costs. While the increase in non-traditional faculty has helped institutions meet costs or temporary enrollment demands, the ACE has raised concerns about whether they are treated fairly. In addition, adjunct faculty members do not typically serve on traditional faculty self-governance groups and committees (ACE, 2001).

In response to data indicating that most academic faculty are liberals, conservatives proposed an "Academic Bill of Rights" which would direct universities to consider political viewpoints in hiring to ensure an appropriate balance of conservative and liberal faculty. While the AAUP agreed in principle with the notion of fostering plurality of perspectives, they were opposed to replacing scholarly or teaching achievement and competence with politics as criteria in hiring (AAUP, 2004).

National security.

In addition to continuing concerns about accountability, costs, research funding and curriculum, higher education has seen the return of an historic challenge to academic freedom—that of national security concerns. Following the Sept. 11, 2001, attacks on New York City and the Pentagon, national security concern has been used to justify reductions in faculty freedom to collaborate with and educate foreign nationals or to challenge existing authority. Restrictions on access to research also have been imposed

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upon foreign faculty and graduate students on the basis of national security concerns. Academicians are concerned that unnecessary restrictions can result in "squelching" the development of the technology needed to fight terrorism (Keel, 2004).

The June 1999 report of Committee A on Academic Freedom and Tenure of the AAUP, the AAUP Council, and participants in the conference on Academic Values in the Transformation of Academic Medicine identified a number of financial factors unique to medical education that may make it particularly vulnerable to infringements upon academic freedom, such as the adoption of a corporate model of management where academic departments operate more as for-profit businesses concerned with generating revenue from patients for medical services than as academic institutions. The close association with hospitals with their hierarchical decision making structures are thought to pose threats to joint decision making and other faculty academic freedoms. This dual pressure to generate income from patient services and close ties with hospitals more interested in marketing services than in teaching and research are thought to create conflicting roles for academic physicians and researchers, who are compelled to act as entrepreneurs (Conference on Academic Values in the Transformation of Academic Medicine, AAUP, 1999). Wright & Wedge (2004) question whether academic freedom can exist in the medical environment given the nature of competing demands for research results and patient needs.

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Rationale for the Study of the Problem

Recent writings suggest that the practice of government and corporate funding of research and education may alter or inhibit academic freedom in medical education (Conference on Academic Values in the Transformation of Academic Medicine, AAUP, 1999; see also Brainard, 2006; Brainard, 2007). In addition to concerns raised about the impact of targeted funding, many of the threats to academic freedom that have been experienced in other disciplines in higher education are thought to also affect medical education and research, such as the treatment of foreign faculty and students in response to 9-11 (Monastersky, 2002; Monastersky, 2007), continuation of Accountability Era trends such as politically appointed oversight boards, and the corporatization of academic medical institutions (Conference on Academic Values in the Transformation of Academic Medicine, AAUP, 1999).

The literature suggests that a growing gap exists between the current state of academic freedom in medical education and the rights to academic freedom to which faculty are entitled according to AAUP guidelines. These guidelines have been adopted by most colleges and universities (National Center for Education Statistics (NCES), 1999; AAUP, 2001). A general question is: How do these developments affect faculty perception of academic freedom at their institutions?

Statement of Purpose

The purpose of this study was to examine whether academic medical faculty perceived that academic freedom at their institutions, as defined by AAUP guidelines, was constrained by targeted funding from government and industry of research and other

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issues identified in the general higher education literature as threatening to academic freedom (AAUP, 2001).

Research Background

Little quantitative research has been conducted that specifically examines the concerns raised in the literature about the effect of Accountability Era controls, national security interests, and corporate and government funding on academic freedom in medical education. For example, a national study of Title IV postsecondary institutions in the United States (across all disciplines, including career and technical schools) indicated that faculty found the "atmosphere" of higher education supportive of free expression in 1999 (NCES, 1999), but this study was not specifically focused upon the discipline of medicine or upon specific issues related to Accountability Era controls, national security or targeted funding of medical education.

There have been some data in the higher education literature that found faculty supportive of tenure as a means to protect academic freedom (Adam, 2004; Goodell, 2005). The results of a 1992 dissertation study indicated that faculty governance may differ according to discipline (Abegunde, 1992). Another qualitative study by Adam (2004) found that regardless of any challenges to academic freedom, faculty still valued academic freedom as a right in academia. Findings from a study by Kunkle (2001) indicated that faculty believed that external agencies dictated internal educational structures and changes. Their study found that faculty viewed their environment as hostile and non-supportive during structural and curricular changes (Kunkle, 2001). Similarly, Goodell (2005) reported that faculty included his qualitative study at one

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institution considered the "business model," with its emphasis on outcomes, corporate-academic enterprise and external funding, threatening to academic freedom.

Targeted Funding

The literature in medical education contains a number of studies related to disclosure, conflict of interest and the repression of research results by industry. In a meta-analysis of 15 drug studies, Miller and Brody (2005) reported that that industry-sponsored research was more likely to report favorable outcomes than independent research. They also discovered that more than half of pharmaceutical companies required investigators to keep information confidential for more than six months after study completion, (Miller & Brody, 2005). In a 2002 study of officials at 108 medical institutions responsible for research agreements, the AAUP (2003) reported that academic medical institutions that accepted corporate sponsored research rarely ensured that their investigators participated fully in the design of trials, had access to all data produced, or preserved the right to publish their findings (AAUP, 2003).

Similarly, the professorate has examined industry involvement in the publication of results, including disclosure. Hong and Bero (2006) uncovered evidence that the tobacco industry attempted to hide its role in scientific articles (Hong & Bero, 2006). Weinfurt, Seils, Tzeng, Lin, Schulman, and Califf (2008) found that of the 441 research articles reviewed on coronary stents (excluding case reports and opinion articles), 316 (or 71.7%) did not include a statement identifying the source of support for the study (including declarations of no support). They concluded that most published research articles on this specific topic under reported financial interests (Weinfurt et al., 2008).

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Cho et al. (2000) conducted a content analysis of conflict of interest policies from 100 U.S. research institutions with the most funding from the National Institutes of Health (NIH) between 1998 and 2000. The authors found that conflicts of interest policies varied widely among the institutions. Less than half of the institutions had committees specifically created to review conflicts of interest and many required the involvement of faculty at the department, school and university levels. While most policies outlined activities that would require disclosure, many of these were not specific to academic research or teaching. Instead, these applied to external activities such as consulting or to nonacademic activities conducted on behalf of the university (Cho et al., 2000).

Another similar study found that two-thirds of department chairs studied in schools with the most NIH funding were found to have a personal relationship with industry, but the chairs perceived that those relationships had no effect on their professional activities (Campbell, 2007). In a study of biotechnology faculty, Streiffer (2006) found that those with industry support were nearly four times more likely than those without such support to have kept results secret and nearly five times more likely to need permission from their sponsors before publishing their findings.

Research Questions

Research question 1 is: Is there a relationship between targeted funding, when controlling for other variables, and faculty perception of academic freedom at their academic medical institutions?

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Research question 2: Is there a relationship between gender, when controlling for other variables, and faculty perception about academic freedom at their institutions?

Research question 3: Is there a relationship between tenure track, when controlling for other independent variables, and faculty perception about academic freedom at their institutions?

Research question 4: Is there a relationship between being an administrator, when controlling for other variables, and faculty perception about academic freedom at their institutions.

Methodology

This quantitative study examined the relationship between targeted funding, when controlling for other independent variables, and faculty perception about the health of academic freedom at their medical education institutions. A quantitative approach was thought appropriate in this research study, which sought to test the validity of claims in the literature suggesting that medical education faculty perceive academic freedom to be constricted due to the practice of targeted funding.

Design

Benefits to using a quantitative instrument to examine the health of academic freedom in medical education included the following: objectivity and reduction of researcher bias; the ability to separate and target specific components of academic freedom for analysis, such as faculty self-governance, institutional autonomy, and freedom of research, teaching and speaking. In addition, analysis of these quantitative

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data enabled the researcher to examine targeted funding while controlling for other variables that were also thought to impact academic freedom. The on-line survey also provided greater confidentiality and took less time than individual in-depth interviews (Huck & Cormier, 1996; McMillan & Schumacher, 2001).

Population.

The independent research variable of targeted funding was collected from a question on a Likert-scale inventory developed specifically for this study which asked if the faculty member received grant support. Sampling strategy was considered purposeful rather than objective as it was based upon the schools' regional location within the middle-Atlantic region of the United States and contingent states and their rank in terms of research grant award from the National Institutes of Health (NIH). This was an appropriate selection criterion for targeted funding as the NIH is the largest sponsor of medical research in academia in the United States (NIH, 2009). A total of 12 allopathic medical schools were selected to participate based upon their NIH grant awards (see Appendix A and B). NIH grant award data was freely available from the U.S. Health and Human Services website for analysis (NIH, 2008) (see Appendix A).

The four schools in the mid-Atlantic region or contingent states with the lowest dollar amount of grant awards, the four that fell in the middle and the four with the highest NIH grant awards were selected for study (see Appendix B). Of those invited to participate, only three were successfully recruited. The schools declined to provide detailed financial information as was in the original research plan. The researcher then

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collected stated and federal government financial information to identify targeted government funding amount for each school in the study for fiscal years 2005-2007.

The second level of sampling was a combination of stratified random selection of faculty and selection of all faculty by one school. Faculty were stratified by discipline--basic scientists and physicians. One school declined to provide its e-mail addresses and thus all basic scientist and academic physicians were sent invitations to voluntarily participate.

Delimitations.

This study excluded students, residents, faculty members who worked as administrators and did not perform teaching or research functions, faculty from other programs such as health sciences programs such as nursing, and other stakeholders in medical education. The study focused solely upon academic medicine, and not other disciplines in higher education, and included only allopathic schools of medicine, not osteopathic schools of medicine. The study included publicly funded, not privately funded, institutions.

Instrumentation.

The dependent variable of academic freedom was measured by an inventory developed for this study using a Likert scale design (see Appendix C). A pilot study of six faculty at one institution (three basic scientists and three academic physicians) was conducted prior to implementation. Little feedback was received, but they provided a time range for taking the inventory.

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The inventory included statements assessing the degree of health of the following academic freedoms: faculty governance, institutional autonomy, and freedom to conduct research, teach freely and speak freely (AAUP, 2006, 3-7) (see Appendix C). Inventory questions were grouped to address each of the areas of academic freedom in an index (see Appendix D. Academic Freedom Index). Each academic freedom category contained eight questions that addressed each of the threats most often described in the literature (see Appendix E. Academic Freedom Threats Index).

Procedures.

From an analysis of NIH grant awards, a total of 12 allopathic medical schools in the mid-Atlantic region and contingent states were selected for study based upon their rank in the lowest, middle and highest dollar award categories from NIH, but only three chose to participate. Additional budget information was collected from an analysis of congressional earmark information available from *The Chronicle of Higher Education*, federal grant awards from NIH, and state government budget information available on the web (Brainard & Hermes, 2008; NIH, U.S. Department of Health and Human Services, 2009; Virginia General Assembly Legislative Information System, 2009; West Virginia Legislature, 2009). These data were collected and analyzed according to categories of research, education or other. Because no schools in the upper rank for NIH grant funding chose to participate, there were only two categories. Due to the lack of variance in the budget data, the researcher chose to use a question on the inventory as the independent

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targeted funding variable instead. That question asked if the respondent received grant funding support.

Faculty were selected on the basis of stratified random sampling by basic scientist or physician or in the case of school 1, all faculty were sent the inventory. The inventory was an on-line instrument and data collection was managed by the Virginia Commonwealth University School of Education Office of Assessment. E-mail addresses were stored separately from responses on the computer to afford greater data security.

The dependent variable of academic freedom was measured by an inventory designed specifically for this study (see Appendix C). A link to a password protected website which housed the survey was imbedded on all invitations. Responses were collected, anonymously and on-line, by the Virginia Commonwealth University (VCU) School of Education Center for Assessment.

Institutions were sent a recruitment package that included a letter requesting voluntary participation, the sample faculty recruitment letter and a link for a preview to the inventory. Institutions were initially asked to provide budget data, but declined. The recruitment letters detailed the procedures for the study, assurances of confidentiality, and the study purpose as being assessment of academic freedom.

To address confidentiality, each individual faculty inventory response was assigned a unique numeric identifier to assure confidentiality in the database. Names and other unique identifiers were not collected and data were maintained on a password protected service at VCU. These procedures were described in the faculty recruitment letter (see Appendix E. Faculty Recruitment Letter) (VCU Technology Services, 2008).

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Data Analysis

Data were analyzed using the statistical test of multiple regression analysis (Allison, 1999). The faculty response was the unit of analysis. The dependent variable of academic freedom was measured by each faculty member's response to the inventory. Inventories were scored and entered into a data set on the computer software program Statistical Package for Social Sciences (SPSS), which was available at VCU (VCU Technology Services, 2008). Data from the inventory were treated as interval data. An interval scale is based on equal units of measurement, each indicating how much a given characteristic or attitude is present (Best & Kahn, 1993, p. 209). Best & Kahn (1993) suggest that it is a better measurement than other types of scales because it provides a relative amount of each characteristic being measured. A factor analysis was conducted in order to create a correlation coefficient for each dependent variable.

In addition, the independent variable of targeted research and other independent variables collected were treated as dichotomous, nominal data. Dichotomous data have only two values of 1 or 0 signifying presence of a characteristic or absence of a characteristic. Nominal data describe characteristics, but are not true measurements (Best & Kahn, 1993, p. 209).

In addition to targeted funding, other independent variables thought to inhibit academic freedom were included for analysis. These were citizenship, tenure status, tenure track or collateral track, educational discipline (academic physician or basic scientist), gender, race, administrator (faculty members had an administrative title or not), and academic rank. All of these variables were nominal in nature and coded as

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dichotomous. Multiple regression analysis was used to analyze the research question by testing for any relationships between the independent variable of targeted funding and the dependent variable of academic freedom, while controlling for other independent variables (Huck & Cormier, 1996, pp. 241-247).

Summary

Medical education operates within a complex system that places unique demands on clinical faculty, who are responsible for patient care, research and teaching (Conference on Academic Values in the Transformation of Academic Medicine, AAUP, 1999). Given the trend toward government and corporate funding of specific research and education and the concerns raised in the literature (Brainard, 2006; Brainard, 2007), a study to examine the relationship of targeted funding and faculty perception of academic freedom in their institutions was justified.

Some of the trends identified as threatening academic freedom in other disciplines are now described as impacting academic medicine. Some of these more general trends include: Accountability Era controls such as political oversight, with an emphasis on specific curricular outcomes (Duderstadt, 2000; Packer, 2005; Altbach et al., 1999), curricular change (Borrego, 2004; Willett et al., 2003); the changing nature of the professorate through the increase in collateral track appointments (ACE, 2001; the AAUP, 2004; AAUP, 2008); the changing role of the president from a leader of scholars to a fund raiser (Cook, 1997), and government concerns over national security interests

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(Schrecker, 1986; Kless, 1990; Keel, 2004). This overview has discussed the history of American higher education, provided a statement describing the problem, detailed a description of academic freedom, and provided related research in general higher education and academic medicine. In addition, methods and procedures for the study were briefly reviewed.

Definition of Terms

1) Targeted funding -- Brainard (2007) defines targeted funding as typically coming from government in the form of legislative funds, earmarked for particular projects, including research. Earmarks are monies Congress appropriates to specific constituents, often universities, that specify their use. Brainard (2007) notes that critics claim that earmarked projects circumvent the merit review process (Brainard, 2007). Thus, in this study, targeted funding is defined as money appropriated from the federal and state governments for specific research or curricular projects.

2) Academic freedom-- In the *1940 Statement of Principles on Academic Freedom and Tenure with 1970 Interpretive Comments*, the AAUP describes academic freedom and tenure. Academic freedom includes full freedom in research and publishing, freedom in the classroom to discuss their subject, and freedom from institutional censorship or discipline (with limitations, such as ensuring that they speak as citizens and not as representatives of their institution) (AAUP, 2006, *1940 Statement of Principles on Academic Freedom and Tenure with 1970 Interpretive Comments*, p. 3). According to the *1940 AAUP Statement on Academic Freedom and Tenure*, academic freedom, in essence,

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encompasses the following rights: The freedom of faculty to pursue research of their choice, disseminate information to the public, express their opinion inside and outside the classroom, develop the curriculum and teach (AAUP, 2001). Hamilton (2002) suggests that professional academic freedom enables the individual scholar to perform three functions: deal with sources of knowledge, results to students, and publish those for the public.

3) Faculty governance -- The concepts of institutional autonomy and faculty governance are described by two AAUP statements: The 1966 Statement on Government of Colleges and Universities and the 1994 Statement on the Relationship of Faculty Governance to Academic Freedom (AAUP, 2006, *1966 Statement on Government of Colleges and Universities* and the *1994 Statement on the Relationship of Faculty Governance to Academic Freedom*). The main theme of the AAUP Statement on Government of Colleges and Universities is joint decision making among faculty, leadership, and its governing board. The statement also recognizes the role that external entities, such as governmental authorities, rightfully play in institutional decisions making and describes the authority and limits for the role of the president. *The Statement on the Relationship of Faculty Governance to Academic Freedom* states that faculty need to make decisions on their own behalf as necessary to the protection of academic freedom.

4) Institutional autonomy -- A definition of institutional autonomy and description of the responsibilities of boards and presidents also is addressed in the AAUP *1915 Declaration of Principles*. The statement emphasizes that the board speaks legally

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for the whole institution, although it may delegate that responsibility, and cautions faculty against speaking in public as if they represent the institution. The AAUP suggests that the president is the chief executive officer, but his or her decisions should receive the general support of both the board and the faculty, and that the faculty should remain informed on the views of the board and the administration on issues. The faculty is empowered to determine the curriculum, degree requirements, and authorize the president and board to grant degrees. In addition, faculty status, tenure, hiring and firings, are all chiefly faculty responsibilities (AAUP, 2001; see also Ramo, 1991).

5) Tenure -- The AAUP describes tenure as necessary to protect faculty academic freedom. There are two main rationales: "1) freedom of teaching and research and of extramural activities, and 2) a sufficient degree of economic security to make the profession attractive to men and women of ability. "Freedom and economic security, hence, tenure, is indispensable to the success of an institution in fulfilling its obligations to its students and to society" (AAUP, 2006, *1940 Statement of Principles on Academic Freedom and Tenure with 1970 Interpretive Comments*, p. 3). Faculty included in this study who are not on the tenure track are defined as collateral, and thus cannot be awarded tenure in the future despite their teaching, administrative service or publication record.

6) Academic rank – Academic rank is the position title held by faculty members. There are four categories of rank in academia, from highest to lowest rank: professor, associate professor, assistant professor and clinical instructor. Rank does not guarantee tenure, although clinical instructors in medicine are collateral track (Jones et al, 2005).

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7) Medical minority -- Medical minority is a term used by the Association of American Medical Colleges (AAMC) to describe racial/ethnic groups that are proportionately underrepresented in medicine. Currently, racial/ethnic groups that are not considered underrepresented in medicine include whites and women, although women are underrepresented in tenure track and leadership positions. All other racial/ethnic groups are considered medical minorities (AAMC, 2008; AAMC, 2007; Bickel, Croft & Marshall, 1996).

8) Generalist and specialist physicians -- Generalist physicians provide primary care services to patients, typically in a community setting, and tend to be graduates of residency programs in internal medicine, family practice or pediatrics. Specialist physicians are graduates of all other residency programs, such as dermatology, pulmonology, and cardiology. Most of the NIH grant funding research is tied to specialty medicine research studies (Cohen & Whitcomb, 1997).

9) Allopathic medicine -- This study included only allopathic medical schools. Allopathic medicine is a system medicine whose aim is to combat disease using remedies such as drugs or surgery to produce effects that are different or incompatible with the disease. Allopathic medicine is considered the traditional medicine track.

10) Osteopathic medicine -- Osteopathic medicine is a system of medicine based chiefly upon the theory that diseases are due chiefly to a loss of structural integrity which can be restored by manipulation of the parts supplemented by therapeutic measures (or use drugs or surgery) (Merriam-Webster On-line, 2009). Only allopathic medical schools were included in the study.

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11) Administrator – The administrator variable was nominal and indicated whether or not the respondent was a faculty member with an administrative title and responsibilities. Options included dean, assistant dean, chair, department head, president or vice president, section chief and other. This variable was coded as 1 and faculty without administrative titles were coded as 0.

12) Collateral track – The collateral track is a position that is not eligible for tenure. Some examples of collateral track faculty members include clinical instructors devoted to patient care, researchers or part-time faculty. A collateral track faculty member may have academic rank, such as assistant professor or associate professor.

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Chapter II. Review of Literature

Overview

"There can be no academic freedom without economic freedom," so noted Sir John Wolfenden, in his address to the Royal Society of Medicine in 1970 (Wolfendon, 1970, p. 844). He suggested that in the private university in the United States, you could do what you like if you could find the money to do it; in the public university, you could get all the money you want if you do what the legislature wanted you to do (Wolfenden, 1970).

Wolfendon (1970) suggested that the private university, although free from government intrusiveness, is in a perpetual search for funds. He stated that it was "idle to pretend that funds which come from these sources are without strings. Government research grants…are almost always mission oriented…. Industrial corporations…expect to see tangible… results from their investments. Alumni are not always the most enlightened of benefactors. The public university is subject to the state legislature, particularly the professional and business needs of the state. The university president in this situation spends less time raising funds from private donors and more time lobbying legislators" (Wolfenden, 1970, p. 844).

This review of the literature provides an overview of this tension between faculty members' rights to academic freedom and political and economic influences external to academic institutions that may inhibit those freedoms. This review begins with the

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history, philosophical framework and rationale for academic freedom in the United States. It then reviews current national and state trends impacting higher education in general, and academic medicine specifically, as well as current challenges to academic freedom. Finally, related research on this topic is presented.

Historical Background

Fuchs (1997) has suggested that the modern concept of academic freedom, as it exists today in America, has roots dating to ancient times. The concept is largely attributed to Socrates, an ancient Greek teacher and philosopher, who was accused of, and later sentenced to death for, corrupting the minds of the young through his teaching (Tredennick, 1969). Socrates was considered the hero of western rationalistic thought, which was based upon critique of any belief through logic and rationality (Searle, 1997, p. 200). Fuchs (1997) believes that American academic freedom was built upon three historical foundations and traditions: 1) the philosophy of intellectual freedom that originated in Greece, arose during the Renaissance and matured during the Age of Reason, 2) the idea of autonomy for scholars which came from the European university system, and 3) the freedoms guaranteed by the Bill of Rights in the U.S. constitution (Fuchs, 1997, pp. 136-137).

The Enlightenment

During the colonial period, American colleges and universities tended to be "copies of copies", firmly rooted in religious doctrine and a fixed classical curriculum, which tended to include subjects of study such as Latin, Greek, and natural philosophy

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(Rudolph, 1990, pp. 24-25) and their curricula were fixed and finite because truth was believed to be fixed and finite (Levine, 1997, p. 37). It wasn't until the early 18th century that curricular reform was considered (Levine, 1997, p. 37). Prior to this time, modern topics – such as anything after the Greek and Roman periods – were largely dismissed as unacceptable subjects in universities such as Yale and Princeton (Levine, 1997, p.39).

The Enlightenment philosophy was at odds with a traditional attachment to a fixed classical curriculum that was resistant to modern topics. Altbach et al. (1999) suggest that the modern concept of academic freedom was born during the Enlightenment Period, which spanned from the 17th century until the early 18th century. Hamilton (2002) also suggests that the story of academe's purpose in America is rooted in the Enlightenment's conviction that reason, if left free, could discover useful knowledge. This system favored individual freedom and open-mindedness (Hamilton, 2002).

Following independence from Great Britain (termed the Nationalist Period), the new nation needed leaders to help create a new American free and democratic society. The Founding Fathers recognized that democracy depended upon the exchange of ideas of an educated citizenry who were free to question authority. In response, the U.S. Constitutional guarantee of free speech was born (Rudolph, 1990).

The Industrial Revolution and the Search for Objective Truth

Altbach et al. (1999) suggest that the principle of institutional autonomy in higher education developed in the mid-19th century in Germany in response to society's needs for technological innovation during the Industrial Revolution. Recognizing that the

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values and goals of political and religious groups sometimes conflicted with the pursuit of knowledge, this German model – called lehrfreiheit for freedom of teachers to teach, and lernfreiheit for the freedom of students to learn-- suggested that the pursuit of truth and creativity needed freedom to develop (Altbach et al., 1999).

Similarly, Fuchs (1997) attributes mid-19th century German Professor Friedrich Paulson with creating the idea of autonomy for higher education. Paulson wrote: "For the academic teacher and his hearers, there can be no prescribed and no proscribed thoughts. There is only one rule for instruction: to justify the truth of one's teaching by reason and the facts" (Fuchs, 1997, p. 139). "The German universities dwell in their own world, outside of politics and their highest achievements are in science" (Fuchs, 1997, p. 140).

During the Industrial Revolution, the American government, like their European counterparts, sought to support economic development of the new nation by funding institutions of learning devoted to the development of technological advances and scientific discoveries (Rudolph, 1990). Academic freedom in its American form was extended beyond the institution to the outer world. In this American version, a faculty member could not be barred from testing his views, gathering data or from publishing his conclusions for the public (Altbach et al., 1999).

20th Century

American graduate education developed in the late 19th century, and by 1910, the research university, with its emphasis on the search for knowledge through research, was well in place in American higher education (Altbach, 2001, p. 15). At around this same time, the AAUP issued a formal declaration of principles in 1915. Even though academic

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freedom as a concept was congruent with both the democratic goal of freedom of speech and of the press, and American society's economic goal of technological innovation and development, the declaration still met with significant public resistance (Altbach et al., 1999; AAUP, 2001). Metzger (1955) has suggested that the public found the idea of protected employment through tenure distasteful. He quoted an editorial from the *New York Times*, dated January 29, 1916:

> Academic freedom, that is, the inalienable right of every college instructor to make a fool of himself and of his college by…intemperate, sensational prattle about every subject under heaven, to his classes and to the public, and still kept [sic] on the payroll or bereft therefrom only by elaborate process, is cried to all the winds by the organizational dons." (Metzger, 1955, p. 208).

The Great Depression impacted academic freedom. Finkin (1998) noted that when the *1940 Statement of Principles on Academic Freedom and Tenure* was being negotiated around 1937, at the time when America was just emerging from the Great Depression, higher education was dominated by relatively small private institutions. A great many were poor and financially dependent on the support of alumni, commercial and other private sector interests, which made the faculty vulnerable to interference from external interests (Finkin, 1998).

1950s Cold War.

Following adoption by the AAUP of its *Statement on Principles on Academic Freedom and Tenure* (Hamilton, 2002), these very procedures and policies were used to bypass and terminate faculty by authorities in the name of national security during the 1950s Cold War period. Academicians were not alone. Actors and other similar groups, who tended to lack strong political or business support, were viewed as living in an

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"ivory tower" above (or outside) the mainstream of the population. This combination made artists and academicians particularly susceptible to allegations of anti-American sentiment or as supporters of Communism (Schrecker, 1986).

University leadership, at some of the most renowned universities and colleges in America, actively worked with government agencies and boards of trustees to terminate professors whose views or actions were seen as not appropriately supportive of national policies. In some cases, faculty members (afraid for their own careers) were intimidated to testify against colleagues, who in later years, were proven innocent (Schrecker, 1986).

Faculty governance and national security during the Cold War.

The very procedures and policies that were designed to protect the professorate, such as faculty self-governance, were bypassed in the name of national security during the Cold War of the 1950s. During that time, Sen. Joseph McCarthy led a national movement targeting certain professions, including the professorate, as threats to national security. McCarthy, created public hysteria by claiming a Communist conspiracy had overtaken key elements of American society. McCarthy and his followers used the public fear of nuclear war and Communist aggression to build popular political support for a campaign to rid society of Communists. Many of those victimized by McCarthyism were not communists –they may have had more liberal political viewpoints or simply opposed certain national policies (Schrecker, 1986).

The threat of Communism was the rationale, and university administrators were the means, by which faculty due process and governance procedures and structures were bypassed or pressured (Schrecker, 1986). Even though the 1940 statement, with its

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protections for due process and freedom of speech, was in place at most universities and colleges, academic leaders were able to distort these due process procedures for their own purposes. While academic freedom of speech is protected, it also is against the U.S. Constitution to encourage violent overthrow of the government. Government leadership convinced academic boards of visitors and presidents that Communism, by its nature, called for the violent overthrow of the government; therefore, Communism, by definition, was in conflict with the law. This definition was further extended to include anyone who did not adopt conservative viewpoints, did not support national policies or did not support the McCarthy movement. Most accused professors, forced into resignation or even jail, were never Communists, but simply held liberal political viewpoints (Metzger, 1999; see also Schrecker, 1986).

The McCarthy period, to date, is still considered one of the most dramatic and gravest threats to academic freedom in the history of American higher education, not only since the development of the *1940 Statement of the American Association of University Professors*, but also since the beginning of the nationalist period (Altbach et al., 1999). What is of most concern to historians is how willing university presidents and boards of trustees were to subvert internal due process protections addressing freedom of speech (Schrecker, 1986). Moreover, the AAUP offered little protection and support during this time for professors falsely accused and unjustly terminated from their positions (Metzger, 1989). The consequences for many victims of McCarthyism lasted beyond the end of the era. They simply never returned to higher education (Martin, 1997). Not only was the professorate affected directly, but curricula were altered, books were banned, and

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research efforts were scrutinized according to their potential to threaten national security (Schrecker, 1986).

O'Neil (1997), in his book *Free Speech in the Community College*, analyzed the legal and ethical dimensions of a select group of legal cases of intrusions of faculty freedoms, including the rights to speak, research, teach, and self-govern. These more recent cases showed the same willingness of presidents and boards to bypass faculty committees and groups designed to protect faculty freedoms (O'Neil, 1997) as they were during the Cold War period of the 1950s (Schrecker, 1986).

Social justice period (1960s-1970s).

The period following the Cold War era, spanning from approximately the 1960s to the late 1970s, marked a boom time for American higher education. A combination of the G.I. bill, in which the federal government provided scholarship funds to veterans from World War II, Korea and the Vietnam Wars, and an increase in the general population from "baby boomers" (children born to returning veterans) resulted in increased enrollment. America had entered a period of relative economic stability and growth, in which federal and state contributions for higher education significantly increased, which also helped keep tuition costs down (Altbach et al., 1999).

This era also marked an increased interest in social issues and the Vietnam War, in particular, sparking American questioning of formal authority and protesting of government actions. Higher education, as in previous decades, responded by increasing enrollment and further expanding the curriculum from classical/liberal arts and scientific/technical studies to the social sciences with an interest in multicultural studies.

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This expansion in enrollment was supported by an increase in federal and state funding for higher education that spanned almost four decades (Altbach, Berdahl, & Gumport, 1999; see also Frost, Hearn, & Marine, 1997).

Enrollments began to decline during the mid-1970s as a result of the end of the baby boom population explosion that spanned from the end of World War II until 1960. As federal funds were reduced, state funding of higher education increased during this period (Fisher, 1988). One concern was that states would use the increased appropriations to justify intrusions of institutional autonomy. Fisher (1988) studied the effects of increased state funding and legislative interest and autonomy for colleges and universities in four states from 1900-1979, prior to the beginning of the Accountability Era of the 1990s. Despite growing concern over state legislative intrusion in higher education, Fisher's study detected no significant increase in legislative intrusion in higher education through state policies during the 1970s (Fisher, 1988).

20th century and medical research.

In addition to the historical trends that affected higher education in general, there were a number of historical events that specifically impacted medicine and scientific research and led to ethical reforms during the 20th century (Shahan & Kelen, 2006). Shahan & Kelen (2006) have suggested that until the 20th century, it was assumed that scientists were generally well intentioned in research, but several events alerted the academic community of a need to codify norms and ethics in human research. The Nazi atrocities brought forth the Nuremberg Code, which advanced the need for voluntary

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consent of the human subject, justification of value and risks in research, and the need for qualified researchers (Shahan & Kelen, 2006).

As a result, the Declaration of Helsinki on Ethical Principles for Medical Research Involving Human Subjects was issued by the World Medical Association (WMA) and adopted by the 18th WMA General Assembly in June 1964. It has been updated and amended six times, with the last amendment in 2002, and is generally considered the most influential document governing research world wide. It highlights the need for patient participation in research that does not put them at a disadvantage medically (WMA, 2007; see also Shahan & Kellen, 2006).

During the 1960s and 70s, three more events demonstrated the need to strengthen human protection in research: The Tuskegee-Syphilis Study (Centers for Disease Control, U.S. Department of Health and Human Services, 2007), the Willowbrook Study and the Jewish Chronic Disease Hospital Case (Shahan & Kelen, 2006). These resulted in congressional hearings and the enactment of the National Research Act of 1974, which created the National Commission for the Protection of Human Subjects of Biomedical and Behavioral Research. This commission formulates public policy for all matters involving human subject research. The recently created Association for the Accreditation of Human Research Protection Programs, an optional certification body, evaluates organizations in the areas of leadership, institutional review board structure, and investigator education in the conduct of research. These organizations maintain that because conducting research is a privilege and not a right, scientists and academicians are required to uphold the public trust (Shahan & Kelen, 2006).

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Trends in American Higher Education in the Current Era

It has been suggested in the literature that the convergence of political, social and economic developments during the late 20th and early 21st centuries have limited the ability of academic institutions to protect themselves from undue external political interests (Kless, 1990; see also Heller, 1996). The Accountability Era movement that began in the 1980s used government funding as a justification to increase scrutiny of funds and other controls, such as political oversight (Cook, 1997). In addition, the Sept. 11, 2001, terrorist attacks were used to justify government interference on the basis of national security interests, particularly the requirement of loyalty oaths from state government, restriction and control of research and publication of results, and restrictions on the hiring and retention of foreign scholars and students (Brainard, 2005; Cook, 1997).

Federal Financing in Higher Education in the 20th Century

The economic downturn of the late 1970s brought on a movement to downsize federal government support for higher education by cost shifting to the states and parents. In response to decreased student enrollment, reductions in federal funding, and increased compliance costs, higher education institutions increasingly relied upon tuition increases and state support to offset the difference (Duderstadt, 2000; Altbach et al., 1999; Kissler, 1997).

Following World War II, growth in higher education was made possible by sustained government support. This changed in the 1970s. Political leadership began to

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shift the support of higher education from the taxpayer to the students and parents. Because institutions did not lower costs in response to decreased funding, they began to turn to private sources for funding. The concern over funding is not expected to end any time soon as higher education might have to compete with other social issues, such as health care or care for the elderly, in the future (Duderstadt, 2000).

Harcleroad (1999) categorizes three main sources of funding for higher education: public, non-profit volunteer, and private, for-profit. Harcleroad (1999) has suggested that this third source provides much of the wealth needed to support the other two, and provides the most potential for conflict (Harcleroad, 1999).

Although a robust economy in the late 1990s allowed some growth in federal funding, it followed two decades of stagnant or declining funding that did not match inflation, and which resulted in neglect of buildings and other needs. In addition, most of this federal funding flowed directly to individuals (the students) rather than to institutions. Even the funding that went to institutions tended to be specifically allocated for research and accompanied by restrictions or federal regulations that are costly. Duderstadt (2000) is concerned that the imbalance between revenues and federal commitments is likely to become more serious as the baby boomers move into retirement and regulatory requirements increase. The decline in revenue, and increase in regulation, is expected to negatively impact the bottom line of higher education. Thus, these financial trends are expected to continue (Duderstadt, 2000).

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State Funding

A sluggish economy at the beginning of the 21st century forced states to close a combined $235 billion shortfall in their budgets. They did it by slashing appropriations, by reducing student aid and by raising tuition and fees (*The Chronicle of Higher Education,* 2004, Aug. 27). State support for higher education had declined (when considering inflation and costs) from the late 1970s to 2000. Cost shifting from the federal government destabilized many state budgets. In many states, the appropriations for prisons surpassed that for higher education (Duderstadt, 2000).

As of 1980, state support of all higher education revenues was 45%; by 1993, it fell to 35% (Frost, Hearn & Marine, 1997). By 1995, it was reported that spending on higher education had taken the worst hit of all state spending categories nationally (Frost, Hearn & Marine, 1997). And, despite small increases in the beginning of the 21st century, state spending in higher education grew by its smallest rate in over 5 years in 2002 (when considering inflation) (Schmidt, 2002). Duderstadt (2000) predicts that generous public support of higher education was unlikely to be sustained in most states over the long term (Duderstadt, 2000).

Alternatively, Kerr (1998) has suggested that this was a positive change. When universities excessively depend upon state funding, he suggests that they face increasing demands from governments for accountability of how public funds are spent. He warned that governments are not prepared to give more public funds without introducing stricter controls. This, in turn, has introduced a conflict for universities, which are, on the one hand funded by the state, and on the other, free to challenge the state. He recommended

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that universities be run by trustees who are businessmen and have full independence from government control in order to protect academic freedom (Kerr, 1998). Business, of course, would bring its own set of constraints.

Tuition.

One way institutions have sought to close the funding gap opened by a decrease in state and federal funding is to shift the burden of costs to the consumer (students and their parents). In 2001, ACE noted that in the previous 10 years, tuition had increased 51%. The causes of these increases, however, were multiple, including a long period pre-dating the current rises in costs when state and federal government had reduced support for higher education, the high cost of new technologies and efforts to keep salaries competitive (ACE, 2001). In addition, some universities and colleges responded by increasing the number of students admitted from out of state who could bring in greater tuition dollars (Frost, Hearn & Marine, 1997).

Out-of-state tuition is thought to be beyond students' reach, and at some universities, such as in states like Florida and Colorado, the number of out-of-state students is declining. The problem is thought to be related to the failure of state appropriations to keep up with the growth of colleges' budgets, forcing institutions to raise tuition to close the budget gaps. At the same time, politicians and college administrators are also pressured to keep tuition fees down for state residents, so they look to out-of-state students to bear a greater share of the financial burden. One result of this trend is that colleges could become less economically diverse (Walters, 2006).

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Public image.

Tucker has argued higher education has lost public confidence as a result of its defense of self-interest against the public good. In a 1998 poll of the fifty state governors, the top four items of perceived importance were: 1) lifelong learning, 2) education available anytime and any place, 3) collaboration with business and industry in curriculum and program development and 4) integration of on-the-job experience with academic programs. In contrast the bottom four items in descending order of perceived importance were as follows: 1) maintain faculty authority for curriculum content, quality and degree requirements, 2) maintain present balance of faculty research, teaching and community service, 3) ensure a campus based experience for a majority of the students, and 4) maintain traditional faculty roles and tenure. Given these data and other trends, Tucker (1999) has suggested that the public sector has moved from the financing of traditional colleges and universities toward support of for-profit universities, distance education to enhance accessibility, and faculty who are more facilitators of self-directed learning than traditional classroom teachers (Tucker, 1999).

Economist and former college president of Kalamazaoo College from 1983-1989, David Breneman (Breneman, 2009) noted: “After four decades of largely unbroken growth in resources and enrollment, higher education is several years into a new era which severely challenges those whose careers have been built on the assumption of unending prosperity” (Frost, Hearn & Marine, 1997, p.363).

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These comments represent the popular political sentiment of the 1990s-- that higher education enjoyed institutional entitlement to government funding in the face of decreased enrollments and without accountability for results. In addition, a 1995 survey suggested that the support of the general public and political leaders for higher education was fragile. Higher education during this period suffered from erosion in public image from a rising number of exposes of problems in higher education, an increase in the volume of public criticism of university practices, and a rising demand for public accountability (Frost et al., 1997).

Levine (1997), president of Teachers College at Columbia, suggests that higher education gave way in importance to prisons, health care and highways at the national level. Government is now asking hard questions about costs, efficiency, productivity and effectiveness (Levine, 1997).

Similarly, Edley (2000) has suggested that academics must serve society to justify their special freedoms and entitlement to academic freedom. Academics are "impervious to the business cycles that buffet ordinary mortals; we remain untroubled by the high-stakes performance evaluations that terrorize workaday wage slaves; and we stand united in our commitment to the inviolability of those three great and good things about teaching: June, July and August!" (Edley, 2000, p. 23). The author suggested that the public is no longer confident about the academic product, and must be educated about how academia operates and its value to society. Lagging voter participation is a reflection of the education the public received in the responsibilities of citizenship. Edley finally suggests that academics must do their job well in educating the public. In his conclusion,

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he suggests that journalists and academics must earn their special privileges and remain every mindful of the needs of the diverse society (Edley, 2000).

The University Presidency

The trend in decreased public support and reduced revenues also is thought to have changed the role of the university president (Cook, 1997). Cook (1997) suggests that, in the current time period, the pursuit of private funding for higher education has become such an overriding need that it has probably permanently changed the role of the university president, who is now considered the chief fund raiser for the institution (Cook, 1997).

Reduced government funding, which began in the 1980, forced higher education to search outside government and tuition for private funding. Rudolph (1990) has noted that the university or college president of the early part of the 20th century was both an administrator and academic leader. In the current era, the major role of the president of the late 20th century and early 21st century is less a leader of scholars and more likely that of a fund raiser (Cook, 1997). This trend came at the same time as power became more centralized, replacing traditional collegial decision making with more hierarchically and centrally controlled decision making (Scott, 1996).

Sowell, a conservative commentator, believes that this change is necessary and that universities need to give more power to presidents and administrators so that universities can respond effectively to external needs and make necessary internal changes. Sowell quotes Stanford University President Gerhard Casper, who wrote that in

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higher education "…power comes from the bottom up. The most important decisions are those concerning admissions, curriculum and faculty appointments, and these are areas where the university president has almost no power" (Sowell, 1994, p. 85).

Related to the issue of power, the AAUP reported that the gulf was widening between the salaries for presidents and senior faculty members. They note that presidents routinely receive salaries three times those paid to senior faculty members, according to data collected during a 2006-07 national financial survey (Research Office, AAUP, 2007).

It has been suggested that this change in the role of the presidency, as well as the large difference in salaries, may further widen the divide between faculty and administration (Research Office, AAUP, 2007). Shaw (2005) conducted a review of back issues of *The Chronicle of Higher Education* and found that there had been more than a dozen faculty votes of no confidence in presidents or other top officials in the last five years. Usually, they occurred with no media attention. He suggested that the unwillingness of presidents to communicate with institutions may have been part of the problem, but also has suggested that the rate was probably about the same as it had always been (Shaw, 2005).

Faculty Governance and Institutional Autonomy

In October of 1966, the AAUP, ACE and the Association of Governing Boards of Universities and Colleges (AGB) collectively issued the *Statement on Government of Colleges and Universities* to establish the principles and procedures to ensure faculty self-governance and academic institutional autonomy as entitled rights for the

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professorate. The purpose of this statement was to give faculty a voice in administrative decision making internally, and to ensure that educational institutions could create their own unified voice, while also balancing the voice of important external stakeholders. It was thought that ensuring both faculty voice and institutional protection from external political interests were needed to safeguard academic freedom. This formal statement sought to respond to a perception by these professional associations that higher education was increasingly losing its independence and autonomy as a result of dependency on external funding and political interests (AAUP, 2001; AAUP, 2006, 1966 Statement on Government of Colleges and Universities).

Both institutional autonomy and faculty governance have inherent weaknesses. Harcleroad (1999) emphasized the need for institutions to be receptive to their environments. He suggests that only those institutions willing to adapt and change, historically, have survived. Thus, institutional boundaries need to be strong enough to protect faculty rights but permeable enough to allow institutions to respond to external needs and adapt (Harcleroad, 1999). Hamilton (2002) notes that self-governance and self-regulation in higher education are based upon peer review, a concept that is fragile. Hamilton (2002) warns that if this system fails, then other, external agencies will take its place (Hamilton, 2002).

Scott (1996) reported common themes in erosion of faculty rights to self-governance at an AAUP conference on "Shared Governance vs. Corporate Management." She noted common themes discussed by faculty included stealth attacks launched during summer vacations when faculty members are away or less attentive. Administrators

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tended to choose hand-picked committees rather than use traditional faculty committees for input. Overall, the conference conclusions were that colleges and universities were gradually displacing faculty governance in favor of a hierarchical, corporate decision making structure. Scott suggests that faculty take their freedoms for granted and assume that they have authentic control over professional standards when they may not (Scott, 1996).

One such case of bypassing faculty self-governance includes a case at the University of Akron, where a faculty member attended a meeting of the University's Board of Trustees during the summer break, when most faculty members were away. The trustees quickly voted on a series of rules to be rescinded or amended without announcing what they were. There was little discussion and motions were made and passed. After the meeting, he found out that the change included eliminating the Faculty Senate's planning-and-budget committee; another reduced the faculty's roles in governing a financial crisis (Smallwood, 2003).

Another similar case includes that of a faculty member who had been a tenured member of the City College of New York since 1969. He had expressed the view that blacks were less intelligent than whites. In response, the president created his own ad hoc committee to examine the faculty member's writings. In addition, the president created a shadow class and students were encouraged to bypass the existing one instead. The faculty member charged suit in federal court that the creation of the committee and its charge denied rights of free speech. In addition, the suit addressed the so-called shadow

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course sections in introductory philosophy. A non-jury trial brought vindication for the faculty member on all counts (O'Neil, 1997).

In response to faculty perception of erosion of faculty governance, some faculties have turned to collective bargaining as a mechanism for ensuring input. Robyn & Fries (2002) suggest that faculty at are able to achieve shared governance through unionization. This change forced administration to accept the faculty as a partner. Their report also suggests that the AAUP has been slow to embrace collective bargaining as an effective tool to achieving faculty rights (Robyn & Fries, 2002).

Tenure

In its *1915 Declaration of Principles on Academic Freedom and Academic Tenure*, the AAUP justified tenure as a necessary safeguard against intrusions into the academic freedom of faculty, who needed to be free to pursue, communicate and the objective truth without fear. The AAUP justifies the need for tenure as a protection for academic freedom (AAUP, 2006, *Appendix I. 1915 Declaration of Principles on Academic Freedom and Academic Tenure*). While the AAUP maintains that tenure is considered essential to academic freedom, data collected by AAUP found an inverse relationship in tenure track positions between 1975 and 1995 (AAUP, 2008).

Regardless of this justification, tenure has been under attack in the late 20th and early 21st centuries, on the basis of economics and political perceptions. Finkin (1998) has suggested that the primary argument for tenure abolishment is to allow universities and colleges to compete more effectively, to facilitate motivation among faculty, and to open new job possibilities for new faculty attempting to enter the higher education labor

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market. Finkin (1998) has stated that the original rationale for tenure was not job security, in and of itself, but to protect faculty members from threats and intimidation. Thus, the justification for tenure is not permanent job security, but to keep academic freedom healthy and free from political and financial threats (Finkin, 1998).

Leik (1998) identified a number of current forces that can negatively impact the health of tenure in higher education. Increased competition for public funds and competition for students are generating budget reductions, which in turn, have negatively impacted public opinion about how universities should be managed. These trends have resulted in a decrease in tenure positions and ultimately can negatively impact academic freedom. The more the university is cost driven and the more adjunct faculty continue to replace regular faculty, the less pure research will occur (Leik, 1998).

If universities continue to move toward adopting a corporate model of management, Leik (1998) is concerned that academics will lose control of higher education. The increased use of adjunct faculty also means institutions have faculty members with little commitment to the institution they serve and fewer faculties who are able to participate in university governance. Finally, he summarizes, that the real crux of the matter is the tenure issue. He argues that if universities are run by dedicated academics, there is little likelihood of serious threat to tenure, but if they continue to adopt a market mentality, tenure is threatened, and, ultimately, so is academic freedom (Leik, 1998).

Bradley (2004) suggests that the increased use of contingent labor (part-time faculty) is marketplace driven because this labor is cheaper. This strategy assumes that

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universities are run by administrators for the convenience of consumer-students, courses are packaged and delivered by low-paid teachers, which is cheaper than producing courses designed individually by highly qualified, tenure-track professors. Finally, she notes that the use of part-time faculty impacts faculty governance, as most part-time faculty are not included in faculty committees and many institutions see participation as less noble than teaching or research (Bradley, 2004).

Tenure and the changing professorate.

The composition of the faculty has been changing dramatically since the beginning of the 1990s. Bradley (2004) reported that in 1969 only 3.3% of faculty appointments were off the tenure track but by the 1990s, over half of new full-time faculty were non-tenure track. Only one in four faculty positions offered were a full-time, tenure-track position (Bradley, 2004).

Similarly, the AAUP conducted a study of all degree-granting institutions in the United States between 1975 and 2005. That data indicated that between 1975 and 2005, tenured faculty positions fell from 36.5% of the total faculty to 21.8%. At the same time, non-tenure part-time track faculty positions rose from 30.2% in 1975 to 48% in 2005 (AAUP, 2008).

Using data from the Integrated Postsecondary Education Data System (IPEDS), Anderson (2002) analyzed results of the survey and demographic data available for the ACE. A comparison was made between data collected in 1987, 1992 and 1998, and analysis identified several trends. Universities increased the numbers of instructional faculty by 46% between 1981 and 1999. Much of this change occurred at the part-time

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level, with faculty who were almost all untenured. The number of part-time faculty during this time grew by 79% while the share of faculty hired on the traditional track increased at a much lower rate. By 1998, nearly half of all faculty were part time in 1998 (although tenure status was not identified); most part-time faculty tend to be in non-tenure track positions. Institutions saved significant money by employing part-time faculty instead of full-time and hiring full-time non-tenure track faculty. ACE warns, however, that part-time faculty cannot fill the administrative needs that full-time faculty can. On average, part-time faculty served on three committees compared to five for full-time tenured/tenure-track faculty (Anderson, 2002).

Competition for faculty.

Another result of decreased public funding of public institutions has been an increased competition for faculty, with public institutions tending to lose faculty to wealthier private institutions. Warding off private institutional recruitment of faculty has always been a problem for public universities. It has become particularly acute as the financial disparity between the two types has widened in recent years. At doctoral institutions, full professors at private institutions earned $122,158 while their peers at public schools made $94,606) on average. Five years ago, full professors at private institutions made $98,606 while their peers made an average of $79,284 (Fogg, 2004).

As that gap increased, some private colleges have embarked on multi-year, multimillion-dollar campaigns to hire hundreds of new professors while public institutions were struggling to keep theirs. For example, the number of faculty at the University of Arizona who received outside offers climbed 61% between 2000 and 2003,

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and the number of faculty losses steadily climbed during that period. In addition to salary, other factors can influence faculty to leave public universities, such as staff and technical support, research space, travel and budgets. Some universities are responding by creating a retention fund, used to counter offers or build support for travel and research. These programs have been largely unsuccessful, and sometimes facilitate conflict between departments such as medicine and the sciences whose professors tend to make more than their liberal arts counterparts. Others turn more and more to outside fund raising from the private sector (Fogg, 2004). Similarly, Smallwood (2005) also reported that in 2005, faculty salaries lagged behind inflation for the first time in eight years.

The Accountability Era

The Accountability Era also is thought to have brought changes that potentially constrict faculty academic freedom. The 1980s marked the beginning of an era of challenges to academic freedom for multiple reasons and from multiple sources. Named the Culture Wars, this trend tied conservative curricular changes with quantitative measurement of outcomes in higher education (Borrego, 2004) and political oversight (U.S. Committee on Health, Education, Labor and Pensions 180th Congress, 2004). These trends resulted in an increase political oversight, attempts to politically diversify the faculty, culture wars over curriculum, and a greater emphasis on outcomes, including faculty productivity, (Duderstadt, 2000; Altbach et al., 1999; U.S. Committee on Health, Education, Labor and Pensions 180th Congress, 2004).

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Outcomes.

The goal of the accountability movement was to apply business outcome models requiring institutions to "prove their worth" through achievement of quantitative goals, and modification of the curriculum to teach students either skills relevant to business needs or study of the Classics (D'Arms, 1999; Altbach et al., 1999). The ACE, in its *2001 Guide to U.S. Higher Education*, notes that along with the changes in funding support (decreases in public funding along increased tuition costs), the public has been increasingly concerned about the quality of U.S. higher education. This concern has been expressed as calls for more precise measures of quality, including achievement tests and measures of faculty performance, such as productivity quotas similar to those used in the corporate sector. These trends have given government more control over quality measures, including accreditation (ACE, 2001).

In response to this call for objective means to measure faculty performance, the the Faculty Scholarly Productivity Index, partly financed by the State University of New York (SUNY) at Stony Brook, was produced by Academic Analytics, a for-profit company. Its purpose was to seek a method for objectively measuring faculty productivity. The index rates faculty members' scholarly output at nearly 7,300 doctoral programs, examines the number of book and journal articles published, as well as journal citations, awards, honors and grants. Some graduate school officials have complained the data are flawed since the names of faculty are taken from university Web sites, which can be incomplete, and others say the index costs enough that it ought to include data on individuals (Fogg, 2007, A8). But, Howard Jackson, former dean of the graduate school

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at the University of Cincinnati, said "Academic Analytics is …valuable because assessment is in the air, and it isn't going away" (Fogg, 2007, p. A8).

The ACE (2001) suggests that this demand for greater accountability is due to the appearance that colleges and universities are out of touch with current events, that research has taken far too prominent a place in academia and that teaching is not held in the high esteem it once was. The organization notes that an increasing number of state governments are demanding that state institutions respond to designated state needs and meet performance targets set by state officials. In its *2001 Brief Guide to Higher Education*, ACE also confirmed a national trend in increased political oversight and accountability in higher education (ACE, 2001).

At a conference on performance-based financing in 20021, Schmidt (2002) reported that a number of policy analysts and public college officials suggested that the practice of tying funding to performance has been largely unsuccessful. Members believed that most of these accountability processes produced little more than increased paperwork and needless controversy. State higher-education agencies found it challenging to devise policies and procedures for measuring and tracking institutional performance. Much of what they have created has been denounced by college officials as unworkable, unwise or unfair (Schmidt, 2002). Similarly, in Missouri, legislators proposed performance-based financing of higher education, in which colleges would help develop performance standards to determine whether they merited increases in state funding. Governor Matt Blunt, Republican, said, "Missouri's colleges and universities need to be accountable to taxpayers" (Schmidt, 2007, A26).

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In addition to testing and quantitative measures, the late 1990s saw a continuation of regulation for higher education. The Clinton administration provided a substantial increase in support for student aid and scientific research in higher education, but also increased regulations tied to that funding. Terry Hartle, senior vice president for government and public affairs at the ACE, noted increased regulatory requirements represented a significant financial burden on academia (Hartle, 2000).

The "Culture Wars" and the Curriculum

The "Culture Wars" over the curriculum that began in the 1980s may have permanently changed the fundamental purpose of higher education, according to Zernike (2002). Conservatives in the culture wars sought educational accountability, a return to an emphasis on the classical studies in higher education and a change in the purpose of higher education to be the production of a labor force for business. In addition, they charged that higher education had developed curriculum of little value, abandoned the teaching mission for research, and that it lacked quality overall (D'Arms, 1999; Altbach et al., 1999).

For most of the 20th century, the purpose of higher education was seen as a chance of self-discovery, broadening of the mind and socialization. Faculty considered skills in analytical thinking, research and writing as important outcomes for graduates. Zernike (200) suggests that the 1990s has represented a shift in thinking, with educators more frequently concerned with products and outcomes and students more interested in learning practical and marketable skills (Zernike, 2002).

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In 1989, Cheney, newly appointed chairman of the National Endowment for the Humanities (NEH), outlined a model plan for universities and colleges that called for creating a structured core with two years of foreign languages, a year each on natural sciences, the social sciences and basic mathematics. To bolster the position, Cheney released a survey indicating that college seniors graduated with major gaps in knowledge. She opposed colleges allowing students to take "narrowly focused" courses rather than broader coursework on the classics (Heller, 1989).

In 1990, Cheney wrote "Tyrannical Machines: A Report on Educational Practices Gone Wrong and Our Best Hopes for Setting Them Right," which suggested that the demise of the teaching function in higher education was largely due the Industrial Revolution and American society's desire to conduct research. Cheney called for a return to the classical curriculum, the teaching mission and a decline in the research mission. In support, Cheney pointed out how faculty members who won campus-wide awards for teaching suddenly found themselves without jobs (ostensibly because they overlooked research) and the institutional practice of luring research stars by offering them reduced teaching loads (Cheney, 1990).

By 1995, A House-Senate conference committee had approved a significant cut of 40% to the NEH budget. A 1992 study had shown that fully two-thirds of research in humanities was supported by the NEH. The endowment provided funds for curriculum, seminars for teaching, public programs and research (Kerber, 1995). Cheney's chairmanship was preceded by conservative William J. Bennett, who believed that teaching had been politicized, trivialized by fascination with popular culture and

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preoccupied with race, gender and class. Some academics suggested that the voice of the left had been missing from the debate over the curriculum entirely (Coughlin, 1989).

Aronowitz, a sociology professor at the Graduate Center of the City University of New York (CUNY) who was opposed to conservative attempts to change the curriculum, argued that colleges ought not to be as concerned with meeting the labor needs of corporate America. He believes that higher education had de-emphasized intellectual growth to become employment agencies in the face of financial pressures. He suggested that specialization should be eliminated, and universities should return to fostering broad education in the interests of students (Greene, 2000).

The faculty response to the growing influence of conservative foundations and right-wing attacks were considered to be ineffective during the 1990s, according to Teachers for a Democratic Culture. Some of the faculty members had organized a national clearinghouse to help social-justice activists on college campuses. Originally intended to help students, the organization expanded its concern to encompass faculty in response to attacks on faculty and curriculum. At a meeting in September 1996 at the Massachusetts Institute of Technology, the group described fights over labor contracts, downsizing and changes in curricular priorities on their campuses as a result of the influence of political conservatism in higher education. The center admitted that right-wing attacks on faculty had been largely effective (Heller, 1996, p.A12).

By the 21st century, Borrego (2002) reported that efforts to control the curriculum at a national level had persisted, which he related to a conservative shift in response to the Sept.11, 2001, terrorist attacks. The practice of flagging had returned to the National

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Endowment for the Humanities (NEH). Flagging allows NEH officials to specifically identify grant applications for extra review, particularly those dealing with multicultural issues. In some cases, flagged proposals are rejected, while those with high marks receive funding. Borrego reported that at least one NEH insider suggested that the driving force was politics, not merit, for decisions in the review process (Borrego, 2004).

Politicization of the Faculty

Another recent trend thought to restrict academic freedom has been efforts to create politically balanced faculty by required colleges to hire equal numbers of conservative and liberal faculty members. David Halperin, a conservative proponent of an "Academic Bill of Rights," claims that he started a national, popular movement to create more politically diverse faculties in response to findings from his survey study showing that most faculty were politically liberal. In his editorial, Halperin lashed out at his critics and noted that he had based his movement, in part, on findings from a survey study that he implemented of 32 college faculty members that showed most were politically liberal. He also noted that other sources conducted the same types of studies and replicated his findings, and that students are among those most in support of politically diversifying the professorate (Halperin, 2006).

Similarly, Tobin and Weinberg (2006) conducted an on-line survey study of 1,292 college faculty from the eastern United States similar to that of Halperin's. The authors found that their faculty respondents were primarily liberal. Their data also found that of those surveyed, only 16% were Republicans and 17% considered themselves conservative. They also asked for a variety of political opinions from capitalism to the

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United Nations. The authors suggested in their interpretation of the data that faculty are not representative of American society, are anti-business, and not politically diverse.

The AAUP's Committee A on Academic Freedom and Tenure has opposed adoption of an "Academic Bill of Rights" by institutions of higher education. (This bill of rights is geared toward "diversifying" the faculty in academia by having politically balanced faculties. To do so, would mean requiring institutions to hire faculty based on their political beliefs). Conservative critics of academia have proposed that states and universities adopt an "Academic Bill of Rights" which would direct universities to require including political viewpoints in hiring to ensure a balance of conservative and liberal faculty. While the AAUP agreed in principle with the notion of fostering plurality of perspectives, they were opposed to replacing scholarly or teaching achievement and competence with political preferences as criteria in hiring (AAUP, 2004).

The *American Enterprise Institute Magazine*, a conservative magazine, published a survey of voter registration among humanities and social science faculty members in the late 1990s. It found that more than nine out of 10 professors belonged to the Democratic or Green party, indicating a lack of political diversity and pluralism in higher education. Bauerlein, professor of English at Emory University, has suggested that conservatives feel shunned in subtle ways by academics—although outright blackballing is rare. He points out that some fields' principles rest on progressive politics, mentors are disinclined to support non-liberal research topics, conference announcements rarely appeal to conservative work and job descriptions rarely match a conservative's profile.

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He also argues that conservative opinion doesn't qualify as respectable inquiry at college and university campuses (Bauerline, 2004).

Salerno (2004), a conservative adjunct professor, has suggested that there is little intellectual diversity in higher education. He suggests that "if you fail to tilt visibly left, you're suspicious. Like incestuous breeding, this homogeneous climate perpetuates a numbing ideological sameness…" (Salerno, 2004, p. 9). Conversely, Hoffer (2007) suggests that in general, most university administrators tend to be fiscal and policy conservatives, pointing out that most donors are often conservative. Often times, liberal faculty have little power to alter arrangements. When he began college in the 1960s, most faculties were conservative or moderate in their views. To be a liberal meant that one was opposed to McCarthyite tactics. In his professional experience, "No attempt was made to marginalize conservatives; they ran the place" (Hoffer, 2007, p. B13).

In order to explore this issue, the U.S. Committee on Health, Education, Labor and Pensions held a hearing on intellectual diversity on college campuses. Speakers from a variety of campuses decried "political correctness" that emphasized a pro-liberal viewpoint. One issue that was discussed was the use of speech codes to discourage students and faculties from making racist or sexist remarks The Committee also criticized the over-representation of politically liberal faculties on American colleges and universities (U.S. Committee on Health, Education, Labor and Pensions, 180th Congress, 2004).

In 2004, Professor Ward Churchill equated U.S. foreign policy with Nazi Germany during World War II and who labeled people working in the World Trade

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Center as “little Eichmanns.” His remarks outraged Colorado House members to such an extent that the legislature sought to change tenure rules. Conservatives used Churchill as an example of the typical bias of American academia (Chu, 2005). Utah Valley State College president Bill Sederburg, said, “The legislators are saying, ‘We don’t want the college to go too far and lose touch with the community’ “(Chu, 2005, p. 38). Legislators have the power of funding, but Utah’s president noted that the college also had an obligation to protect academic freedom (Chu, 2005). Another outcome of Churchill’s remarks was that Senate Bill 85 proposed in the Colorado legislature did not pass. Its purpose was to strengthen academic freedom of faculty.

Levinson (2007) believes that intellectual diversity bills, which resemble the Academic Bill of Rights, impose threats to faculty academic freedom. These bills have been introduced in at least five states in 2007. The purpose of the bills is to require political and ideological diversity on campus. She suggests that the bills are a cover for hiring conservative faculty members, regardless of credentials. She believes that when educational decisions, including hiring decisions, are placed in politicians’ hands, colleges and universities become more vulnerable to institutional control based upon political and popular beliefs (Levinson, 2007).

International perspectives.

The accountability movement has not been restricted to American higher education; other countries have struggled with similar, related concerns. Roger Kerr, executive director of the New Zealand Business Roundtable and a proponent of

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accountability in higher education, outlined a broad rationale for reducing the strength of policies protecting academic freedom (Kerr, 1998).

Kerr proposed three main arguments against special faculty rights to academic freedom. The first is that higher education did not need special rights and privileges, as those rights and privileges were extended to all citizens of New Zealand in their rights to freedom of expression. Higher education was not the sole critic and conscience in a free and democratic society. He also argued that the dominance of elite opinion, such as in academia, can lead to "political correctness," in which opinion is held so self-righteously that criticism of it is denounced and silenced rather than answered. Secondly, if universities are to play the role of critic and conscience of society, who, then, criticizes the universities? Thirdly, if there is a legally prescribed role of critic and conscience of society, he asks why should this only be exercised by universities in a free and democratic society –this is the right of all citizens and other groups, such as the media, business, voluntary associations, and churches, who also can be the conscience of society (Kerr, 1998).

Similarly, Canadian academicians have also expressed concern about conflicts of interest when accepting industry sponsorship of research. A group of professors of medicine and academic scientists from Canadian universities published a report, Defending Medicine, Clinical Faculty and Academic Freedom, which included six recommendations and a warning that "pressure to produce clinical income takes time away from teaching and research" (Birchard, 2004).

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National Security Concerns.

In addition to continuing concerns about the impact of trends in funding, accountability, the changing professorate, and curriculum, a historical threat to academic freedom is thought to have returned—that of national security—following the Sept. 11, 2001, terrorist attacks on New York City. This national security concern has been used to justify reduction in faculty freedom to collaborate with, and educate, foreign nationals; to challenge existing authority; and unwieldy restrictions on research that repress the development of the very technology needed to fight terrorism (Keel, 2004).

The Sept. 11, 2001, terrorist attacks resulted in three trends that potentially inhibit academic freedom: the requirement of loyalty oaths, restricting foreign students and researchers from studying or teaching in America, bypassing faculty governance, and the control of access to data or restriction of the publication of research findings (AAUP, 2003, Academic Freedom and National Security in a Time of Crisis. Report of the AAUP Special Committee on Academic Freedom and National Security in a Time of Crisis).

Loyalty oaths.

In the name of national security concerns, loyalty oaths were required of professors during the 1950s Cold War. Refusing to sign during the 1950s could mean loss of a job or even imprisonment (Schrecker, 1986). The terrorist attacks of Sept. 11, 2001, have been the justification to return the requirement of loyalty oaths for all public employees in Ohio (O'Neil, 2006). Introduced as the Ohio Patriot Act, a form is required of public employees, including academicians, and asks six questions about support for terrorism. Leaving a blank ensures rejection (Levinson, 2007).

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O'Neil (2006) has pointed out parallels between the Ohio state loyalty requirements for incoming faculty, the Ohio Patriot Act, that was implemented in 2006 and the loyalty oaths of the McCarthy era. The requirement is similar to the loyalty oaths of the 1950s McCarthy era, when incoming faculty were asked about their membership or support of the Community Party (O'Neil, 2006).

A new teaching assistant in Ohio now must "declare that he or she is not currently a member of any organization on the Terrorist Exclusion List, has not used any 'position of prominence…within any country to persuade others to support [such] an organization,' has not 'knowingly solicited funds or other things of value' for such a group, has not 'committed an act that you know, or reasonably should have known, affords 'material support or resources' to such organization and has not hired or compensated a person known to belong to such groups, 'or a person you knew to be engaged in planning, assisting or carrying out an act of terrorism' " (O'Neil, 2006, p. B24).

O'Neil believes that the job application question violates constitutional guarantees of free speech and threats the academic freedom of professors, who might be forced to choose between employment and their responses. He also suggests that the broad array of questions is largely undefined and open to myriad interpretations. In a series of cases during the 1960s, the Supreme Court struck down – on both free speech and due-process grounds—disclaimer-type loyalty oaths required of public employees, namely professors and teachers. The justices emphasized the dilemma that a conscientious person would face when asked such ill-defined questions (O'Neil, 2006).

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Admission and retention of foreign students and scholars.

Sylvia Kless, associate director for student services and a senior international student adviser at the University of Rochester, identified the national security concern post-September 11, 2001, as having a significant deleterious impact on the admission and education of international students. The recent national security concern has resulted in increased paperwork and internal administrative costs that burden higher education, the forcing of international student advisors into the role of continuous reporting on student activities, visa delays and denials for students already accepted, and an increase in complications for study abroad. She is concerned that the country might suffer a significant economic loss if foreign student education is not facilitated. International students contribute almost $12 billion annually to the nation's economy (Kless, 2004).

In 2004, the Department of Homeland Security (DHS) obtained direct access to information from the two major tracking systems developed post-9/11 to monitor foreign visitors. The FBI has been required to ask the DHS for information from both the Student and Exchange Visitor Information System and the U.S. Visitor and Immigration Status Indication Technology System (Higher Education and National Affairs, 2004). In 2006, the U.S. Commerce Department abandoned a plan that would restrict foreign student and scholar access to sensitive technology. That plan would have required American higher education to obtain export-control licenses for thousands of foreign students and researchers (Field, 2006).

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Faculty governance.

One recent example of bypassing faculty through presidents in the interests of national security is the case of Professor Yousry, who was terminated because of his federal indictment on charges of assisting a terrorist organization by serving as a courier or conduit. The indictment arose in connection with Yousry's work as an Arabic translator for an attorney, the main subject of the indictment. The central administration ordered the president to remove Yousry from the classroom. Neither the university's counsel nor the president consulted with faculty in making the decision to suspend him. Yousry claimed that it was not clear that he had been suspended as no written notice had ever been sent. The AAUP concurred with Yousry that he had reason to believe that his appointment had indeed been continued until the next semester, as there had been no written notice, and because faculty had not been included in the decision making, as is their protected right (AAUP, 2004, November 4)

Specific Threats to Academic Freedom in Medical Education

Trends thought to specifically threaten academic freedom in medicine, include some of the same issues affecting higher education in general. Namely, these include the practice of hiring more collateral, non-tenure track faculty than providing tenure track positions(Liu & Mallon, 2004),and intrusions from government in the interests of national security into faculty rights to admit and retain students and hire faculty (O'Neil, 2006; Brainard, 2005; Kless, 1990). In addition, state line item appropriations (Willett, Moore, Owens, Manser & Marsland, 2003) and corporate gifts to fund curricular projects

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(Day, 2006) and targeted funding of education and research from government and industry (Brainard, 2005; Brainard, 2006) are seen as inhibiting academic freedom in medicine.

In 1999, the AAUP recognized that some of the same trends impacting other disciplines were also affecting medical education, while other trends were new or specific to medical education. In May 1999, the AAUP adopted the *Academic Freedom in the Medical School Statement* in response to major changes in process in academic health centers and a perception that concern about a degradation of rights to academic freedom was rarely debated in medical schools. The AAUP noted that the modern medical school had many of the same characteristics of a market-driven health care system, with professors often charged with entrepreneurial responsibilities. As such, it was marked with conflicting roles and responsibilities for faculty members and administrators. The Statement reiterated basic rights to academic freedom in the statement, including the freedom to inquire and publish, the freedom to teach and the freedom to question and to criticize (AAUP, 2006 *Academic Freedom in the Medical School Statement).*

The Changing Professorate in Medical Education

The trend related to the decrease in tenure track positions that has occurred in higher education also has impacted U.S. medical schools for physician and basics scientist faculty. Liu & Mallon (2004) conducted a study using data from the 1) Faculty Personnel Policies Survey of the Association of American Medical Colleges (AAMC) in 2002, to which all 125 U.S. allopathic medical schools responded, 2) the AAMC Faculty

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Foster, which included key employment characteristics of approximately 95 of full-time faculty, 3) institutional faculty handbooks and other policies and procedures; and 4) telephone interviews and e-mails with a variety of faculty and institutional representatives.

The authors found growth in the hiring of non-tenure track faculty, particularly in the hiring of physicians and Ph.D. appointments in clinical departments. Between 1975 and 1993, non-tenure track faculty appointments across all higher education institutions increased from less than 19% to over 27% of full-time faculty. By 1999, national data indicated that 55% of all new full-time faculties were hired into non-tenure-eligible appointments. Most startling, less than half of all physician faculty members in 1999 had tenure or tenure-track appointments. In the early 1980s, approximately 65% of new full-time hires in basic science departments were appointed to the tenure track, but this percentage dropped to 45% by the late 1990s. By 2000, most medical schools appointed new basic science faculty to a non-tenure track. The authors speculate that this trend emerged in response to the increase in soft money (grants and corporate funded research), so that institutions don't have to continue the appointments once the money goes (Liu & Mallon, 2004).

A second trend the authors noted was the alteration of the financial guarantee that tenure provides. The most recent survey of the AAMC Faculty Personnel Policies Survey results demonstrated that the financial guarantee of tenure for basic scientists had changed, limiting their financial commitment to their tenured basic science faculty members. In 2002, slightly more than half of schools with tenure reported a specific

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financial guarantee for tenured basic science faculty. In conclusion, the authors noted that medical schools are responding to the new economic requirements beginning with the 21st century by adjusting appointment and tenure policies and practices to allow for greater staffing flexibility. In turn, this has translated into limited financial liability for them and multiple recruitment and retention pathways (Liu & Mallon, 2004). Liu & Mallon suggest that medical schools are not eliminating tenure, per se, but rather preserving its basic tenets in new forms (Liu & Mallon, 2004).

While the literature points to external intrusions into academic freedom to research and teach, Jones, McCullough and Richman (2005) argue that threats might also come from within institutions. They suggest that departments, which are hierarchically managed by chairs and division heads, can also limit good ideas. Academic leaders have control over the entire department's research agenda, and influence in guiding research interests, the authors argued. Jones et al. (2005) suggest that by restricting research projects to areas of conventional interest, department leaders can stifle creative and forward thinking hypotheses. To support their point, the authors emphasize the conflicting data from studies of the relationships between patient outcomes and attendance at religious services. While the topic of the study might be considered insignificant or inappropriate to chairs and division leaders, these data indicate a need for further research. Finally, the authors conclude that academic freedom is not to be reserved for those who pursue safe or approved ideas, and encourage chairs and division heads to support unusual and creative research, particularly from younger faculty who

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have little chance of receiving external funding from government agencies or industry (Jones et al., 2005).

Targeted Funding of Research and Education in Medical Education

Targeted funding aimed at specific research projects and curricular change in medical education is of primary concern to the professorate. Government line item appropriations or earmarks and corporate funding that target specific research foci or curriculum have replaced general funding of basic research and curriculum (AAUP, 1999; Brainard, 2006; Brainard, 2007). In addition, concern has been expressed about politically motivated research or efforts by government to block needed research, such as the stem cell debates (Brownstein, 2001).

Targeted government funding and medical education curriculum.

In order to meet a predicted shortage of physicians, a national, state and private grant initiative was implemented at select medical schools throughout the country during the mid-1990s. This program sought to change the culture and curricula of medical education from lecture hall formats taught by basic scientists and sub-specialty hospital-based rotations to community-based, problem centered teaching methods that would, hopefully, encourage generalist medicine career choice. Career choice in generalist medicine began declining in 1980, which was thought to be related to the influence of corporate and federal funding of specialized research that encouraged medical students and residents to choose specialty careers. This shortage led to a Robert Wood Johnson Foundation national funding program aimed at increasing the numbers of generalist

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physicians by expanding the generalist curriculum during the 1990s and early 21st century. Virginia was the only state in the nation to receive a collaborative grant to change curriculum at all three of its allopathic medical schools (Willett et al., 2003).

Grogan (1998), a basic sciences faculty member at VCU School of Medicine, argued that the program was a political initiative aimed at producing a supply of generalist physicians and that the curricular changes were actually harmful. As a state line item appropriation and federal grant program for curricular change, Grogan expressed that the curricular changes "diluted" medical education and it was led by "educationists."

Another criticism of the program was that the predictions were initially wrong, and that there would not be a physician shortage; however, in 2001, the AAMC and other groups reversed this position. The AAMC predicted a 20% shortfall of physicians by 2020, which would be particularly difficult for elderly and poor patients who might have to travel farther to see a doctor. If the current rate of decline continued, the AAMC predicted that there would be only five physicians per 100,000 in 2020 (Mangan, 2007).

Another issue thought to inhibit medical academia's control over curricular decisions is its reliance upon federal government funding of residency training. The federal government keeps a cap on the number of residency training positions it pays for through Medicare. That cap is currently set at 1996 levels, which means teaching hospitals that need to increase residency positions will have to pay for them (Mangan, 2007).

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Most recently, the U.S. Supreme Court declined to hear a lawsuit challenging the residency matching system. The class action suit was filed in 2002 on behalf of medical residents, who alleged that the National Resident Matching Program, sponsored by the AAMC, violated federal antitrust laws by sparing programs from having to compete against each other for residents (Schmidt, 2007, Feb. 19).

Targeted corporate funding and the curriculum.

Reductions in general funding also have led academic medicine to increasingly rely upon external private funding through research dollars, endowments and private funding by pharmaceutical companies (Nicholson, 1995). Packer (2005) and Mangan (2004) note that scholars have reported concerns about the impact of the corporate funding of medical education on curriculum and research. At issue is pharmaceutical and other industry sponsorship of continuing medical education, when corporations offset speaker travel costs or presentations, as long as the data coincide with their corporate purposes (Packer, 2005; Mangan, 2004).

Steinman & Baron (2007) have suggested that the expectation of reciprocity for corporate sponsorship can dissuade lecturers from being critical of companies' products (Steinman & Baron, 2007). Brodkey (2005) notes that a large portion of the $1.2 billion costs of continuing medical education (CME) for physicians are underwritten by pharmaceutical firms. She believes that promotion of pharmaceuticals has overwhelmed changed traditional medical education (Brodkey, 2005). Charatan (2006) also has

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reported that pharmaceutical companies spend more than $20 billion a year on marketing and that drug companies alone spent $13,000 a year per doctor on marketing.

Industries also provide corporate gifts, which can range from small items such as pens to sponsorships of conferences, speakers, etc. (Day, 2006). Day, a registered nurse, believes that health care providers should be held to higher standards because they work toward a larger social and civic good and their decisions carry risk to the health of patients. She argues that the practice of accepting corporate gifts gives the appearance of impropriety, which can, in turn, disrupt patient-provider trust (Day, 2006).

Similarly, DeAngelis (2000) has suggested that companies provide such support in order to influence clinical decision making within the educational environment. In the end, she believes that such support might erode public trust (DeAngelis, 2000). Brennan, et al. (2006) have suggested that market incentives in the United States are posing challenges to the principles of medical professions, including the trust that patients have in physicians. The authors argue that the two assumptions made by medical and industry groups are: 1) small gifts do not significantly influence physician behavior and 2) that disclosure of financial conflicts is sufficient to protect patient interests. The authors call the validity of these two assumptions into question. They note that social science research has shown that people have an impulse to reciprocate for small gifts, and that individuals receiving gifts are often unable to remain objective. And, the organizations that give these gifts tend to expect reciprocity. The authors call for the prohibition of gifting, industry support of continuing medical education, and other related recommendations (Brennan et al., 2006).

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Targeted government funding of research.

Due to continued reductions in general, non-targeted funding from government, academic medicine has had to rely increasingly upon targeted funding from government and corporate interests to sponsor research (AAUP, 1999, ¶ 4). Targeted funding from the federal government typically comes in the form of legislative funds, earmarked for particular projects, and also includes grant funds from the National Institutes of Health. Earmarks are funds that Congress appropriates to specific constituents, often universities. Critics claim that earmarked projects circumvent the merit reviews federal agencies normally use when considering grant awards (Brainard, 2007) and may alter the research agenda at institutions, where research interests of government and industry may differ from those of faculty (Nicholson, 1995).

DeAngelis (2000) has called for a better balance between the need for research funding and independent decision making among physician educators and researchers. In 1999, the National Institutes of Health provided $17.8 billion for research and the top 10 pharmaceutical companies spent $22.7 on clinical research. She predicts that there is little chance that sufficient funding for important clinical research, especially clinical trials, will be forthcoming from sources other than sponsors with a vested interest such as government and industry (DeAngelis, 2000).

Despite these concerns, the practice has continued. In 2006, earmarked grants were expected to climb to a total of $2.4-billion, according to estimates from the American Association for the Advancement of Science (AAAS), a 63% increase from 2003. In addition to issues inherent to the practice of earmarking funds, the public

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perception is that federal agencies' science budgets have grown when most of the growth is actually due to earmarks targeted for specific projects and research (Brainard, 2006).

Most recently, federal funding of research has shifted from funding of medical research toward a focus upon the physical sciences, with the NIH receiving level or less funding, with the most of the cuts in the area of academic research. The NIH is the largest source of public money for targeted academic research. President Bush's goals for 2007-08 were to enhance the nation's global economic competitiveness by increasing high-technology goods and thus proposed more support for the National Science Foundation and the Department of Energy's Office of Science. Those agencies together with National Institute of Standards and Technology were slated to receive a total of $11.4 billion in funding, more than what they received in 2006. In order to provide for the large increases for the National Science Foundation and the Energy Department, budgets for other agencies were either reduced or remained flat (Brainard & Hebel, 2007).

In the late 1990s, Rhoades and Slaughter (1997) identified the trends toward the creation of research parks and technology transfer offices. They termed this trend academic capitalism, which they describe as a move toward higher tuition, more competitive grants and contracts, more solicited private gifts and other sorts of competitive monies and a trend away from general funding from government (Rhoades & Slaughter, 1997).

Support for medical research through NIH has continued to decline in terms of inflation-adjusted dollars since FY 2003, according to the Ad Hoc Group for Medical

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Research (AHGMR) (Ad Hoc Group for Medical Research, 2007). The 2007 administrative funding strategy translated into an 11% reduction in purchasing power for the NIH. According to Richard Knapp, executive vice president of the Ad Hoc Group or Medical Research, the President's overall budget request in 2006 was $64.5 million less than in FY 2005, and the proposed budgets for most institutes and centers were between 1 and 1.5% lower than the two previous years. The President's budget proposal represented the fourth consecutive year that NIH funding failed to keep pace with inflation as measured by the Biomedical Research and Development Price Index. In terms of inflation-adjusted dollars, the President's budget represented a loss of 11% of purchasing power since 2003 (Knapp, 2006).

G. Steven Burill, Chairman of the Campaign for Medical Research, noted that the current administration had recommended flat funding for NIH since 2004. Richard M. Knapp, Ph.D., Chair of the Ad Hoc Group, for Medical Research stated "NIH research is driving the transformation of the practice of medicine. At a time of unparalleled scientific opportunities and unprecedented health challenges, NIH should be in a position to support more research, not less." (¶ 3, ¶9, AHMGR, 2007).

In some areas of government research, the political motivations of are clear. Stem cell research, for example, has been opposed by politically conservative groups and politicians because it uses cells from embryos, which conflict with the morals of some religious groups. The Bush administration, known to oppose stem cell research for these reasons, successfully blocked NIH and other health groups from beginning grant programs examining stem cell research (Brownstein, 2001). Medical researchers and

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scientists have been stymied in their efforts to develop this technology by restrictions placed by government and note that other countries, which are less restricted, are forging ahead in this area (Clark, 2004).

Targeted corporate/industry funding of research.

The AAUP is particularly concerned about the effects of corporate control or influence over medical research. The AAUP (1999, ¶1-2) issued a press release in 1999 warning that public health may suffer when companies are allowed to exert pressure on researchers, delay publication, withdraw funds and even file lawsuits when findings from research conflict with the market objectives of corporations (AAUP, 1999, ¶1-2).

The AAUP pointed to two cases in particular as examples of corporate intrusion into faculty rights to publish findings in the medical education environment. Dr. Nancy Olivieri, professor of medicine and pediatrics at the University of Toronto, saw funding for her research cut, and threat of a lawsuit, if she informed patients that her drug studies found dangerous side effects. (AAUP, 1999, ¶3). Similarly, Dr, David Kern, associate professor of medicine at Brown University, lost his full-time research position, following protests from a textile producer that had funded Dr. Kern's research. Dr Kern had uncovered a new occupational lung disease among company employees (AAUP, 1999, ¶5).

Conversely, Streiffer (2006) argued that corporations have a right to suppress or deny publication of findings for research they have funded in academia. Without such funding in the first place, the study might never have been undertaken, and corporations

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have a right to reap rewards from their investment through patents and other means to deny findings to other corporations with whom they compete in a fair marketplace (Streiffer, 2006).

According to the AAUP (1999, ¶ 4), funding from university-based corporate sponsorship of research has grown from 5% in the early 1980s to as much as 25% at some institutions. This escalation coincides with a trend in reduced government funding for basic research; the AAUP argues that this trend potentially hinders faculty rights to research and publish findings without financial or political constraints (AAUP, 1999,¶ 4). One criticism of corporate funding of academic research is that such funding has impacted the research agenda (and potentially academic freedom) in universities, whose priorities may differ from those of the industry. Streiffer (2006) reported that a 1985 Harvard Project on University-Industry Relationships in Biotechnology study found that biotechnology faculty with industry support were four times more likely than those without such support to have kept results secret and were nearly five times more likely to need permission from their sponsor before publishing (Streiffer, 2006).

Dr. Angela Brew, President of the Higher Education Research and Development Society of Australia (HERDSA), claims that research is in peril in academia, calling for the faculty to reclaim the research agenda by developing new forms of research in order to justify its existence. Brew (2001) points out that research is highly valued in academia. She suggests that the conflict between the new economic model and traditional research values is the most intense conflict within higher education. She believes that the value of

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most academic research today is based upon its ability to bring in research funds (Brew, 2001).

Another concern about corporate funding is its influence on the research agenda, particularly related to the publication of results. The AAUP (1999, ¶1-2) warned that public health suffers when companies are allowed to exert pressure on researchers to delay publications when results conflict with corporate market goals. According to the AAUP (1999, ¶ 4), funding from university-based corporate sponsorship of research has escalated since the 1980s and has potentially hindered faculty rights to conduct research of their choice without financial or political constraints (AAUP, 1999, ¶ 4).

Sharpe (2002) noted in remarks to the 27th annual American Association for the Advancement of Science (AAAS) Colloquium on Science and Technology Policy that the commercialization of science had created new incentives for clinicians, academic institutions and researchers to join forces with for-profit industry. This partnership was seen as helpful to states seeking to augment limited funds for higher education. One concern about this trend is that results are often exempt from the usual peer-review requirements. By their nature, she believes that they entail conflicts of interest that might threaten the judgment of professionals, the credibility of research and publication, the safety of human subjects and inhibit free inquiry (Sharpe, 2002).

In a review of research on the chemicals atrazine, formaldehyde and perchloroethylene, 60% of studies by non-industry researchers found these chemicals to be hazardous, while only 14% of industry-sponsored studies did. One researcher broke her confidentiality agreement and published unfavorable results regarding the drug

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deferiprone. In response, the University of Toronto attempted to dismiss her. The same institution, which received a $1.5 million gift from Eli Lilly Company, rescinded its job offer to another researcher when he was publicly critical of the Eli Lilly drug Prozac. To discourage such practices, the General Accounting Office has recommended that all potential conflicts of interests be disclosed. Sharpe (2002) noted that when there is a risk to public safety, it is essential that these potential conflicts of interests be reported and guarded against (Sharpe, 2002; see also Birchard, 2004).

The editors of the *American Journal of Psychiatry* issued a statement in 2006 suggesting that the profession's credibility depended upon complete disclosure of any potential conflicts of interest in publications. The editors required the changes in disclosure for publication as they were concerned about public confidence in the research and clinical decision making of the medical profession, particularly when drug research was so heavily funded by pharmaceutical companies (Freedman et al., 2006).

Similarly, the *New England Journal of Medicine*, in 1984, was the first of the major medical journals to require authors of original research articles to disclose financial ties. The ties between clinical researchers and industry include not only grant support, but other financial arrangements, such as gifts, speakers' bureaus, consulting arrangements, patents and royalties, etc. While the justification for such ties has been the need to transfer technology easily from academia to the private sector, the second rationale, which is more straight forward yet less often stated, is that academic medical centers need money (Angell, 2000).

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Angell (2000) suggests that the current situation that drove academic medical centers to begin fostering academic-industry relationships and the sponsorship of industry is rooted in the reductions in Medicare reimbursements in the 1997 Balanced Budget Act, as well as third-party payers who wish to keep hospital costs down. Pharmaceutical companies, of course, can help make up the difference. Angell (2005) suggests that the current situation ultimately leads to bias and the possible skewing of research toward the trivial. Many researchers, she claims, insist that they cannot be bought, but she responds that this collaboration creates goodwill on the part of researchers, who might hope that the funding will continue with favorable research study results. Finally, she raised concerns that faculty members who extensively work for industry are distracted from their other commitments to the school's educational and research missions (Angell, 2005).

Angell (2000) recommends stronger conflicts of interest guidelines, the prohibition of certain financial ties, the enforcement of rules of conflicts of interests, and forbidding pharmaceutical representatives from promoting their products at hospitals to students and house staff are also needed. In addition to possibly introducing bias to research and teaching, the price of marketing projects, she notes, is an escalation in the price of drugs. Ultimately, she believes, the public will not be sympathetic (Angell, 2000).

In November 2004, the AAUP's Committee A on Academic Freedom and Tenure adopted the *Statement on Corporate Funding of Academic Research* to respond to these trends. Committee A noted that learning, intellectual development and progress all

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required freedom of thought, expression and the right of the researcher to convey results beyond the classroom or institution. The committee was particularly concerned about research with a goal of commercial innovation. Corporate funding of academic research had grown more rapidly than support from all other sources over the previous two decades. The major concerns included bias, influence on the research mission and topics chosen by universities, pressure to change results, corporate control of publication of data, denying researchers the right to communicate or publicize health risks to subjects, inducement of rivalry among faculty, and financial conflicts of interests (AAUP, *Statement on Corporate Funding of Research*, 2006).

Conversely, Streiffer (2006) believes that corporations have a right to suppress or deny publication of findings for research they have funded in academia. Without such funding in the first place, the study might never have been undertaken, and corporations have a right to reap rewards from their investment through patents and other means to deny findings to other corporations with whom they compete in a fair marketplace (Streiffer, 2006).

Issues regarding ownership of data and peer-review process remain as a result of the continued trend in joint corporate-academic ventures (Racette et al., 2006). The authors suggested that accepting corporate funding for research brings potential risks to institutions and academic researchers. Research involving potential liability against corporations in particular undergoes intense, but not necessarily objective scrutiny, which is different than the typical peer review process in academia. Data, including confidential patient information, may be subpoenaed in court cases (Racette et al., 2006).

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In addition, corporations may attack research findings that potentially impact the marketability of their products or services. When Dr. Herbert Needleman reported an association between low intelligence quotient (IQ) and high lead levels in children with environmental lead exposures, his research was attacked by the lead industry in an attempt to discredit his research. Although the allegations failed to find evidence of academic fraud and his research was later replicated, he endured academic and personal hardships. Finally, Racette et al. (2006) recommend more rigorous restrictions on the legal system to prevent interference with medical research, more comprehensive federal legislation recognizing a research scholar's privilege in order to ensure that rights to research and publish findings are protected (Racette et al., 2006).

Miller and Brody (2005) also believe that the pervasive influence of the pharmaceutical industry on the design and conduct of research and the analysis and publication of results is a major threat to evidence-based medicine. The authors suggest that drugs marketed by pharmaceutical companies may be less safe than the literature suggests and negatively impact clinical decision making and patient outcomes. Clinicians may regard study results published in peer reviewed journals as an indicator of validity, when in fact there might be commercial bias in design and reporting (Miller & Brody, 2005).

The ways in which industry-sponsored drug trials are biased include the following:

- Comparing a new drug with a sub-therapeutic dose
- Failing to publish negative studies while selectively reporting favorable outcomes
- Duplicating publication of positive results

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- Omitting adequate statistics for assessing clinical significance
- Exaggerating benefits or minimizing risks of company products (Miller & Brody, 2005).

While Miller and Brody (2005) agree that corporations are to blame, they suggest that physicians cannot avoid responsibility for their contribution to commercial biases in research. They point out that patients trust physicians to be competent and research participants trust that clinical trials produce valuable information and that their participation will not be harmful. In the end, academicians are also responsible for industry bias and must maintain professional integrity despite corporate funding. Because the financial goals of pharmaceutical and biotechnology companies are not aligned with that of academic and clinical research, it poses challenges to the professional integrity of academic researchers when they accept funding for studies (Miller & Brody, 2005).

The authors suggest that it is time for the academic medicine to ethically examine its role in contributing to biased industry-sponsored research. They believe that academic medical centers have restructured their research centers with the goal of attracting industry support so that a culture of entrepreneurialism now exists in academic medicine. They assert that investigators compromise academic integrity when they knowingly conduct studies in which negative findings will not be published (Miller & Brody, 2005).

Kessler et al. (1994) also raised concerns about seeding trials with physicians, usually office-based practices. (Seeding trials are research studies, usually related to the pharmaceutical industry, which are really marketing strategies to develop interest among physicians in a particular product. The authors note that features that distinguish these studies from scientific studies include the use of a design that does not support research

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goals, recruitment of investigators who are not experts, disproportionately high payments given to investigators, sponsorship of the studies by the company's sales and marketing section instead of its research center, minimal requirements for data and/or the collection of data that are of little or no value (Kessler et al., 1994).

Psaty and Rennie (2006) reported that the prescription of thiazides was four times higher in the United Kingdom than in Norway, and conversely, the prescription of alpha-blockers was four times higher in Norway than in the United Kingdom. They attribute these differences to pharmaceutical company seeding trials. Finally, the authors suggest that the health of the public would be better served by small short-term studies and more well-designed large, long-term trials (Psaty & Rennie (2006).

Pharmaceutical companies, as well as third-party providers, are increasingly trying to get patients to switch from their original prescriptions to their medications. When done appropriately, however, switching can sometimes reduce costs and possibly improve quality of care or both, but other types of switching or replacements to patients can cause harm (Kessler et al., 1994).

Tobacco funding.

Funding from the tobacco industry also has raised concerns. Jones (2005) argued in his letter to the editor of *American Journal of Respiratory and Critical Care Medicine*, that academic institutions should not be discouraged from accepting tobacco industry money. Such a policy, he suggested, would "deny the collective faculty a right to prevent an individual member from accepting support, if it is from an unpopular source." He suggested that if the source of research funding was explicit, the design sound and

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interpretation honest, and the investigator free to publish the findings, then an academic university should be free to accept corporate sponsored research dollars (Jones, 2005).

In his response, Glantz (2005) stated that universities should decline funding from the tobacco industry because of ongoing evidence that the tobacco industry developed and implemented a sophisticated 50-year-old strategy to subvert science. He also cited the recent exposure of secret documents held by the tobacco industry – and revealed as a result of litigation-- that indicate their part in repressing the truth about smoking. Glantz (2005) suggests this history and the evidence call for a collective recognition that universities need to be protected from manipulation from the tobacco industry (Glantz, 2005). In addition, there is a growing body of literature indicating those faculties who have industry ties are more likely to report favorable results, conduct lower quality research and less likely to disseminate their results to the scientific community (Cho et al., 2000).

Conversely, Miller (2007) applauded the actions of the faculty senates at the University of California and Stanford University, who rejected by substantial margins proposals to ban university researchers' acceptance of tobacco funding. Miller (2007) called the demand for rejection of the money by some faculty moral blackmail, and argued, "If universities succumb to such blackmail, they cease to have real academic freedom. Instead, they become more like Soviet-style institutions, at which science took a back seat to political indoctrination" (Miller, 2007, B16). Grants from tobacco-related companies to the University of California make up less than half of 1% of what the institution receives for research funding (Miller, 2007).

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Stanford's president, John Hennessy, noted: "The university gets a lot of money from the Department of Energy (DOE), (sic) runs the nation's nuclear-weapons labs. If we divest all DOE money, then we should close (sic) (the Standard Linear Accelerator Center and) several engineering and physics labs. Without DOE money, we should get out of the business of computer science. ExxonMobil and BP fund more alternative-energy research than the federal government" (Miller, 2007, p. B16). Miller (2007) calls corporate sponsorship of research a necessary evil.

Ignacio Chapela, a University of Berkeley, California faculty member, raised questions about the impact of corporate funding upon academic freedom. In 1998, the College of Natural Resources accepted $25 million from Novartis, a Switzerland based firm. Chapela had appealed to the faculty senate, claiming his tenure review process had been corrupted by pro-industry faculty members and ultimately won. A report issued by an external review committee concluded that academic freedom was not compromised but that the deal did introduce conflicts of interest (Dalton, 2004).

Patents.

Patents are also thought to impact medical research. Moses and Martin (2001) reported that the number of university-generated patents increased from approximately 400 in 1990 per year to more than 2800 in 1999, with the universities' share increasing from 55-73, as a result of passage of the Bayh-Dole Act 20 years ago. The purpose of this act was to foster the transfer of technology from universities to the private sector, to hasten new products to market and to lessen universities' dependence on federal sources of support (Moses & Martin, 2001).

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While academic-industry partnerships have resulted in the development of new technology, it also has created conflict of interest issues for faculty members. Academic-industry partnerships offer direct financial rewards in the forms of fees, royalties and equities while also funding research. These conflicts of interest are of particular concern because they potentially bias research and affect dissemination of results (Cho et al., 2000).

Moses and Martin (2001) have raised concerns about the influence of patents upon universities' rights to academic freedom. The authors believe there may be a conflict of interest when the university itself owns equity or receives royalties. They suggest that universities: 1) separate commercially supported research from other research, 2) enhance external oversight, 3) create a new entity separate from the university to hold equity and receive royalties. The authors suggested that additional protection would be gained by groups of universities and investigators jointly creating a new entity to manage equities and royalties (Moses & Martin, 2001).

In response to issues related to corporate funding of research, the AAUP issued its *Statement on Corporate Funding of Academic Research* as part of the work done by a subcommittee of the AAUP's Committee A on Academic Freedom and Tenure. It was approved and adopted by the AAUP in 2004. The statement addressed recent cases of university-industry and faculty-industry relationships that were both public and problematic in terms of academic freedom and issued a series of recommendations to address conflict of interests and academic freedom. The statement's recommendations included the following: 1) Ensure faculty have a major role in formulating institutional

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policies with regards to research undertaken in collaboration with industry and monitor conflict of interest policies and contracts. 2) Faculty should be involved in periodic review of the impact of industry sponsored research on education and the recruitment and evaluation of researchers. 3) Regular procedures should be in place to address alleged violations of conflict of interest and monitor that they are followed. 4) Regularly review policies for conducting assessments in light of the fact that the environment is dynamic and changing (AAUP, 2006, Statement on Corporate Funding of Research).

Philanthropy and medical education.

Less often mentioned as a potential threat to academic freedom is the funding that comes in the form of philanthropy, which can be gifts from philanthropic foundations, groups or individuals, yet those also tend to be targeted for specific purposes. Termed megaphilanthropy, the literature has raised concern about the large amounts, which have reached unprecedented amounts (Katz, 2009). The Robert Wood Johnson Foundation funded programs to increase the supply of physicians by funding curricular innovations. Now, the foundation will spend $22 million to instead educate nurses in order to address the current nursing shortage. The majority of the funds were targeted for master's and doctoral students in nursing (Killough, 2009).

Another example of philanthropy aimed at specific education and research is that of Alfred Lerner, owner of the Cleveland Browns of the National Football League, who gave $100 million for a clinical research center aimed at developing clinical research and education. This gift enabled the creation of a joint venture between the Cleveland Clinic and Case Western Reserve University (Shoichet, 2002). Similarly, the Jeffry M. and

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Barbara Picower Foundation gave Massachusetts Institute of Technology a gift of $50 million to research brain disorders such as schizophrenia (Blumenstyk, 2002).

Katz (2009) suggests that this increase is a reflection of the upward redistribution of wealth that began in the late 1970s. He claims that concentration of wealth in the top 1% of the population is approximately the same as it was in 1929 (Katz, 2009). It appears that wealthy individuals and philanthropic groups have the same ability to influence medical education and the research agenda through targeted funding as government and industry.

National Security and Medical Education

National security interests have been thought to inhibit academic freedom in the discipline of medicine by limiting access of foreign nationals to teach or learn in America or by repressing the publication of results (Monastersky, 2002; Monastersky, 2007, ¶4). In response to the 9-11 terrorist attack s in New York City, the AAUP issued a *Report of the AAUP Special Committee on Academic Freedom and National Security in a Time of Crisis* in October 2003. The report was broad based, and included, among other issues, concerns about threats to academic freedom from the USA Patriot Act, limiting educational access to foreign students and scholars, the mingling of law-enforcement and intelligence-gathering activities, the inhibition of public access to information, and the disclosure of electronic communications (AAUP, 2003, Academic Freedom and National Security in a Time of Crisis. Report of the AAUP Special Committee on Academic Freedom and National Security in a Time of Crisis).

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Levinson (2007) believes that a growing focus upon politics and ideology also threatens academic freedom in medical education. Foreign scholars have been prevented from entering the country, sometimes for their ideology. In most cases, however, the government has declined to explain the reasons for withholding visas. In one case, Riyadh Lafta, an Iraqi professor, was denied a visa to lecture about the public health effects of the Iraqi war; his research contradicted findings of the U.S. government about death tolls from the war (Levinson, 2007).

The AAUP and the Council on Governmental Relations reported 138 instances in 20 institutions in 2003 and 2004 that government had attempted to restrict participation of foreign nationals and repress the publication of results. The National Research Council of the National Academies has concluded that security restrictions imposed since 2001 have constrained universities and that these controls should be loosened in the interests of the nation's economy. The committee's report, "Science and Security in a Post 9-11 World," is based on the results of three meetings of academic leaders and officials from the defense and security agencies. Government officials warned that universities could exacerbate threats to the United States by allowing in potential terrorists as students or providing foreign nationals access to dangerous pathogens or technology. The members of the panel concluded that "to keep the country secure and to maintain our freedoms, we must strive to keep U.S. universities open, welcome students and scholars from around the world, and participate in international research, while limiting access when warranted and placing appropriate restrictions on narrow and well-defined high-risk areas" (Monastersky, 2007, ¶4).

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Recently, however, government contracting agencies have put restrictive clauses into contracts, which often preclude foreign nationals from certain countries from participating on university projects and allow government agencies to stop publications of results. Government agencies are increasingly using the terms sensitive but unclassified to justify controls (Monastersky, 2007, ¶9).

In the current era, Monastersky has reported on a variety of situations where government agencies have asked faculty to withhold reports to keep potentially dangerous information away from enemies of the United States. He points out that these situations pose a conflict between the public's need to know for their own safety and the government's need for secrecy, and that these situations have occurred with much greater frequency in the post-9-11 terrorist attacks (Monastersky, 2002).

In response to new governmental regulations restricting the dissemination of research findings, the AAUP formed the Special Committee on Academic Freedom and National Security in Time of Crisis, which met on November 10, 2002, to discuss concerns and issue a report. The committee notes that the line between classified research and unfettered pursuit of knowledge has blurred since 9-11. Administrators are under increased pressure to restrict research deemed sensitive or to submit to prepublication review by the government. They suggested that academic medical centers have been hit particularly hard by the new regulations issued by the government. The AAUP notes that many academic medical centers have simply avoided pursuing research in sensitive areas (Keel, 2004).

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The National Science Advisory Board for Biosecurity, a federal advisory committee, warned that scientists and government officials must avoid censoring or blocking legitimate research in the name of preventing terrorist access to those findings. At the same time, the board noted that terrorists can misuse findings and the board has called for tighter controls to protect the public health. The board was created by the Bush administration to develop methods for balancing publication of scholarly results with national security interests. Despite opposition from the U.S. Department of Health and Human Services, the National Academy of Sciences recently published a paper describing how terrorists could kills thousands of people via botulism, illustrating the need for journal editors to develop systems for flagging papers (Brainard, 2005).

Select Research Studies

Little research has been conducted to specifically examine the effect that targeted funding of research and curriculum has on faculty perceptions about academic freedom at their institutions. A review of abstracts and studies in academic medicine and the higher education literature indicate that most studies have focused upon qualitative research methods, have studied only one dimension of academic freedom at one institution, were not focused upon issues specific to medical education, not recent, and/or did not examine the relationship between funding and faculty perception of academic freedom (Abegunde, 2002; Adam, 2004; Kunkle, 2001; Swindle, 1995).

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Higher Education

During the McCarthy era of the 1950s, the Academic Freedom Committee of the Chicago Division of the American Civil Liberties Union conducted a survey to measure academic freedom in each of more than 50 colleges and universities in the state of Illinois. A two-page test of academic freedom was constructed, including items on rights of students, rights of teachers and general rights. Although approximately 200 questionnaires were mailed to Illinois colleges, only 73 replies were received at the time of the publication of the article. For faculty, the survey specifically asked about freedoms from special requirements or oaths and of research (Kerr, 1954). (During the McCarthy era, many higher education institutions required faculty to take an oath declaring they were not a member of the Communist Party as a condition or employed or continued employment) (Schrecker, 1986). Results of the study suggested that serious deficiencies existed in academic freedom for both faculty and students, although the survey was not randomized and had a response rate of 36 (Kerr, 1954).

Conversely, a 1999 national study of Title IV postsecondary institutions in the United States (including career and technical schools) indicated that faculty found the "atmosphere" of higher education supportive of free expression. The National Center for Education Statistics' (NCES) conducted a stratified random survey study to ask faculty respondents a large variety of questions concerning their work. Specific to academic freedom, the survey asked faculty to identify their degree of agreement or disagreement with the following statement: "Over recent years at this institution, the atmosphere is less conducive to free expression of ideas." More than half disagreed with that statement

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(56.3% disagreed and 10.3% strongly disagreed) (NCES, 1999). While the survey study findings unearthed faculty perceptions about their work environment, there was only one question directly related to academic freedom. Questions related to self-governance and research, for example, were not included. Faculty may have interpreted the statement a variety of ways, including as a reflection of their regard for their department chair or of their institution's leadership, for example (NCES, 1999).

A quantitative study of faculty perceptions of academic freedom found statistically significant differences between perceptions of tenured and non-tenured faculty at Emory University, with non-tenured faculty perceiving significantly less academic freedom. No significant differences were found in age or gender, and only two disciplines significantly differed in their perceptions of academic freedom. While the focus of Swindle's study provided support for the rationale for tenure, it did not focus upon other issues thought to affect medical education and included faculty from one church-based institution rather than multiple institutions (Swindle, 1995).

Similarly, Hanson (2003) conducted a phenomenological study of faculty experiences with academic freedom. Data indicated that faculty assumed rights to academic freedom until it was threatened or limited by others, and tenure enhanced faculty member feelings of job security (Hanson, 2003).

Abegunde (1992) conducted a dissertation study examining differences in perceptions between faculty in applied sciences to faculty in liberal arts and other selected fields in relationship to the effects of university-industry alliances on campus governance and operations. Results indicated that the two groups held significantly

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different perceptions on the effects of alliances on openness in research, freedom to teach, and publicize research (Abegunde, 1992). The results of Abegunde's study of one university provide some support for the current study's focus upon one discipline and examination of how faculty perceive academic freedom to be affected by corporate interests. His findings support the hypothesis that issues related to faculty governance and institutional autonomy may differ according to discipline (Abegunde, 1992).

Goodell (2005) conducted a qualitative study on how core, tenured faculty at a large metropolitan university defined academic freedom and tenure. The study did not include medical school faculty. His study included qualitative data gathered from 30 individual interviews of faculty members. Approximately two-thirds of the respondents believed that the business outcome model of management in higher education could potentially undermine or restrict academic freedom. One respondent stated, "I think that kind of leads to a chilling effect is …(sic), the business model, the funding, the grantsmanship, becoming more entrepreneurial…all that is part of the business model, stated one respondent" (Goodell, 2005, p.196). Another noted, "I think that one of the things that has diminished academic freedom on the VCU campus is the effort by the administration, for largely financial reasons as I understand it, to encourage – to strongly encourage – external funding and partnering with state or corporate organizations which have a different – a very highly directed research mission as opposed to the disciplinary construction mission of academic disciplines…(sic)in terms of…the whole direction that the university is moving in, in fact, diminishes that space that I call academic freedom".

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Findings from Goodell's research provide some support for the concern that the business model may inhibit faculty perception of academic freedom (Goodell, 2005, p. 196).

Regardless of threats identified in the literature, the data on rates of AAUP censures of institutions for violations of academic freedom provide an interesting pattern. The data indicate that faculty may not perceive a decline in their rights to academic freedom. If there is sufficient evidence that an institution violated faculty due process rights or any of the academic freedom or governance protections, faculty members have the right to challenge that decision to the AAUP. If the complaint is deemed justified, the AAUP will file a letter of censure and publish findings to the professorate nationally. In this way, the institution is then censured (AAUP, 2004).

An analysis of AAUP censures of institutions that have allegedly restricted or violated faculty rights found an almost inverse pattern to that expected (See Figure 1. AAUP Censures) (AAUP, 2004). Generally, the 1940-50s are considered a dark period for academic freedom due to the McCarthy era (Schrecker, 1986), while the 1960s and 1970s are considered growth years in terms of enrollment, curriculum, programs, research and funding (Altbach, 1999). Surprisingly, the numbers of censures during the decade of the 1950s (identified as one of the darkest periods in the academy's history) have an almost inverse relationship numbered at only 19, while the highest peak for censures was during the 1970s with a number of 47. The Accountability Era during the late 1980s did not appear increase the censure rate. The numbers actually declined to 32 during the 1980s and fell to 29 during the 1990s, the decades identified as problematic in the literature (AAUP, 2005).

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Metzger (1989) conducted a quantitative analysis of almost a thousand cases of AAUP censures between 1913-1957. Core problems given as reasons for disputes were faculty behavior, political opinions or activities of faculty, educational policy disputes, personality clashes and faculty morals. Most case (61%) came from larger universities (Metzger, 1989).

The low numbers of censures during the 1950s have been attributed in the literature to AAUP leadership neglect or faculty too afraid of retaliation from their administrators or the government to file a case with the AAUP (Schrecker, 1987; AAUP, 1989). The peak in the 1960s and 1970s also could possibly be attributed to faculty demands for greater involvement in governance and a feeling of being less restricted (Altbach et al., 1999). There is no explanation in the literature for the decline of censures spanning from the 1980s to the current period. It's possible that during times when faculty feel more secure, they are more likely to pursue their rights, and in those times when academic freedom is perceived to be (or is) threatened, such as during the McCarthy period of the 1950s, faculty are less likely to seek censures against administration.

Academic Medicine

A study by Kunkle (2001) also supports the notion of differences among disciplines in attitudes toward change and academic freedom. Kunkle (2001) explored experiences of medical school faculty related to curricular changes in medical education. The consensus indicated that external agencies dictated internal educational structures and changes, and that faculty viewed their environment as hostile and non-supportive

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during structural and curricular change. Faculty tended to resign themselves to change as they saw themselves without influence, felt they could not protect themselves, and did not perceive that change would be successful (Kunkle, 2001).

Regardless of these challenges to academic freedom, findings of two separate qualitative studies suggest that faculty still value academic freedom. Adam (2004) examined faculty response to an assessment initiative at a private research university. The study's findings suggested that change initiatives that challenge values central to faculty culture, such as institutional autonomy and self-governance, may cause conflict and resistance from faculty (Adam, 2004). A 2005 qualitative dissertation study also found that faculty valued their academic and were concerned about the effect of the business model of leadership upon faculty academic freedom (Goodell, 2005).

The U.S. General Accounting Office conducted a study of five academic research institutions which received the most NIH funding and had extensive technology transfer activities. The General Accounting Office had seen tremendous growth in biomedical research funding and collaborative relationships between private industry and academic researchers, raising concerns about financial conflicts of interest. Despite the fact that all institutions had policies and committees to address issues of conflict of interest, the study found that there appeared to be no direct oversight, research and financial relationship information was kept in multiple locations and formats, and one of the universities could not find such information at all. The researchers also found no mechanism to ensure that disclosed information reached institutional review boards and there was a lack of uniformity in how financial interests were disclosed (Dievler, 2002).

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Publication of findings.

Miller and Brody (2005) conducted a a meta-analysis of 15 drug studies, and reported that that industry-sponsored research was more likely to report outcomes favorable to the drugs studied than was independent research. Another study found that more than half of pharmaceutical companies require investigators to keep information confidential for more than six months after study completion, potentially delaying crucial information necessary to the practice of medicine and patient health. In addition, 12-34 of industry-sponsored academic researchers requested access to results from their sponsors but reported being denied (Miller & Brody, 2005).

In addition to medical school sponsorship, professional association meetings and conferences (where physicians and basic scientists come to report and learn about findings) also tend to be supported by industry funds. Johnston & Go (2007) analyzed stated financial conflicts of interest (FCOIs) of 9,792 abstracts, speakers and planners listed in the 2005 and 2006 programs of the American Society of Clinical Oncology Annual Meeting. Twenty-seven percent of abstracts, 46.8% of speakers, and 67.4% of planners reported FCOIs. Research funding accounted for less than 25 of the total disclosures. The fact that more than half of speakers and planners had FCOIs presents a dilemma when evaluating the findings. In their conclusions, the authors suggest that complete and timely disclosure must be required, but also more stringent regulation of financial relationships is warranted as well (Johnston & Go, 2007).

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Financial conflict of interest.

A 1985 Harvard Project on University-Industry Relationships in Biotechnology study found that biotechnology faculty with industry support were four times more likely than those without such support to have kept results secret and were nearly five times more likely to need permission from their sponsor before publishing. Finally, Streiffer (2006) argues that objections to academic-industry relationships must establish either that a restriction is harmful or an infringement of academic freedom (Streiffer, 2006).

Campbell et al. (2007) published findings from a survey study on institutional academic-industry relationships at 125 accredited allopathic medical schools and the 15 largest independent teaching hospitals. The teaching hospitals were those that had received the largest amount of funding from the NIH in 2004. Four clinical department chairs were sampled at each institution from medicine, psychiatry and two randomly selected clinical department chairs, as those were departments that tended to receive the highest amount of funding from industry for educational activities (Campbell et al., 2007).

The study revealed that almost two-thirds (60) of the department chairs (both clinical and non-clinical) had a personal relationship with industry, 80 of the clinical department chairs had at least one form of relationship, and more than two-thirds of both clinical and non-clinical chairs perceived that having a relationship with industry had no effect on their professional activities. On the other hand, 72 viewed a chair engaging in more than one industry-related activity (such as a role in a start-up company, consulting, serving on a board) as negatively impacting independent and unbiased research. In terms

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of the types and frequency of academic institution-industry relationships, 28 received personal compensation for participating in a meeting, 21 for research, 19 for speaking at a CME event, and 16 for travel to a professional meeting. Six reported owning equity in companies and three reported receiving compensation for writing. In terms of grants, the findings suggest that academics believe that there is a financial threshold for which compensation can begin to negatively impact the objectivity of research. A total of 69 felt that unrestricted grants up to $10,000 benefited independent, unbiased education and training, which dropped to 45 reporting an overall benefit for unrestricted grants of more than $100,000. For restricted grants, 53 responded that grants up to $10,000 were beneficial; however, only 27 reported that restricted grants of more than $100,000 enhanced independent, biased research (Campbell et al., 2007).

The AAUP (2003) also has reported the results of a 2002 study of officials at 108 medical institutions responsible for the content of research agreements. The study found that academic medical institutions that accepted corporate sponsored research rarely ensured that their investigators participated fully in the design of trials, had access to all data produced, or preserved the right to publish their findings. The authors also reported that several of their respondents said they felt powerless in contract negotiations with corporations (AAUP, 2003).

There have been several studies reported in the literature related to disclosure and conflict of interests. Hong and Bero (2006) found broad tobacco industry involvement in scientific knowledge production, dissemination and in the development of scientific books. They also found evidence that the tobacco industry attempted to hide its role in

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scientific articles. In their conclusions, the authors suggest that the industry's efforts to gain credibility through collaboration with academia raise concerns about the ethics of tobacco industry funding (Hong & Bero, 2006).

Cho et al. (2000) conducted a content analysis of conflict of interest policies from 100 U.S. research institutions which had the highest levels of funding from the National Institutes of Health (NIH) between 1998 and 2000. The authors found that the processes for disclosing, reviewing and managing conflicts of interest varied widely among the institutions as described by policies. Only 38 of the institutions had committees specifically created to review conflicts of interest and many required the involvement of faculty at the department, school and university levels. Many policies outlined activities that would require disclosure and review and typically described several kinds of activities that were specifically prohibited, but many of these were not specific to academic research or teaching. Instead, these applied to external activities such as consulting or to nonacademic activities conducted on behalf of the university (Cho et al., 2000).

In terms of disclosing financial conflict interests when publishing results, Weinfurt, Seils, Tzeng, Lin, Schulman, and Califf (2008) found that of the 441 research articles reviewed on coronary stents (excluding case reports and opinion articles), 316 (or 71.7%) did not include a statement identifying the source of support for the study (including declarations of no support). The authors did suggest, however, that this inconsistency may in fact be due to journal policies. Regardless, they concluded that most published research articles on this specific topic under-reported financial interests,

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providing some support for concern about a lack of transparency in reporting results of research in this area (Weinfurt et al., 2008).

In addition to financial disclosure, Cho et al. (2000) found in their study of university policies that prohibited activities typically included excessive consulting, using university facilities or the university name in consulting, employment by outside entities, using confidential information for personal benefit, accepting personal gifts from companies and negotiating agreements with companies in which the individual had a financial interest. Thirty-six percent of policies specifically described activities that were allowed and generally not considered conflicts of interest. Only 19 had specific prohibitions or limits on activities related to research and teaching and only 11 policies specified a time limit for delay of publication or presentation of research results to allow review by corporate sponsors or for patents to be filed. The specific timed limits ranged from 0-12 months; 88 did not mention delay of publication or presentation or included a nonspecific statement that academic activities should not be delayed longer than necessary. In comparing public to private institutions, the authors found approximately twice as many private as public institutions had specific limits on publication delay and financial interests in corporate sponsorship, but the differences were not statistically significant. The authors recommended that, for clinical research in particular, policies that encourage disclosure to patients and the public and have more limits on financial interests in research of faculty are warranted. They note that most policies on conflict of interest at major U.S. research institutions lack specificity (Cho et al., 2000).

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This review of the literature and relevant research indicates that the medical professorate appears mostly concerned about how industry support of research and education limits academic freedom through the repression of the results of publications, lack of financial disclosure and the use of educational events to market products. A research study to assess if there is a relationship between targeted funding and faculty perception that academic freedom at their institutions appears justified. The general higher education literature appears more concerned about a broad spectrum of threats related to academic freedom such as faculty governance. A research study to examine if these broader issues raised in the general higher education literature are also a concern for faculty in academic medicine also appears to be warranted.

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Chapter III. Methods

The literature suggests that a gap exists between the present state of academic freedom in medical education (Keel, 2004; Jones, 2005; AAUP Conference on Academic Values in the Transformation of Academic Medicine, 1999; AAUP Statement on Corporate Funding of Research, 2006) and the rights to academic freedom as set forth in the AAUP guidelines that are adopted by most academic institutions (AAUP, 2001). The purpose of this study was to examine if there was a relationship between academic medical faculty perceptions of the health of their rights to academic freedom and targeted funding from government and industry.

The components of academic freedom studied were the rights to academic freedom as stipulated by the AAMC. These included institutional autonomy, self-governance, and freedoms to speak, teach and research and publish the truth (AAUP, 2006, pp. 3-7). Professional associations, including the AAUP and AAMC, suggest that external financial and political interests have intruded upon institutional autonomy and faculty rights to academic freedom through the practice of targeted funding (Kapp, 2006; Hamilton, 2002; Monastersky, 2007; AAUP, Statement on Corporate Funding of Academic Research, 2006; Angell, 2000; Brainard, 2005; Brainard & Hebel, 2007; Chu, 2005; Glantz, 2005; Goodell, 2005), yet little quantitative research has been conducted that specifically focuses upon the unique issues that threaten academic freedom in medical education.

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Design

A quantitative approach was used in this research study as it sought to test the validity of claims in the higher education and medical literature suggesting that the practice of targeted funding of research and education inhibited academic freedom in medical education (AAUP, Statement on Corporate Funding of Research, 2006; McMillan & Schumacher, 2001).

This study examined the relationship between the dependent variable of faculty perception of academic freedom and multiple independent variables by measuring their responses on an inventory designed specifically for this study. Data were analyzed using the statistical test of multiple regression analysis. This statistical test was applied in order to measure the relationships of the independent variables with the dependent variables of academic freedom. Individual faculty responses were the unit of analysis.

The research questions follow.

1) Is there a relationship between targeted funding, when controlling for other independent variables, and faculty perception of academic freedom at their institutions?

2) Is there a relationship between gender, when controlling for other independent variables, and faculty perception of academic freedom at their institutions?

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3) Is there a relationship between citizenship, when controlling for other independent variables, and faculty perception of academic freedom at their institutions?

4) Is there a relationship between being an administrator, when controlling for other independent variables, and faculty perception of academic freedom at their institutions?

The independent variable of targeted funding was measured by one question on the inventory labeled targeted funding: Is any portion of your salary funded by a grant? This nominal variable was dichotomous. Response choices were yes or no.

Originally, the medical schools were asked to provide budget data which would have been used to calculate a targeted funding dollar amount per faculty member to create the independent research variable of targeted funding. This approach was not used because the medical schools declined to provide this information, citing the amount of staff time it would take. Instead, the targeted funding variable was created from responses on a question on the inventory asking if the faculty member received a portion of his or her salary from a grant.

Population

The population included faculty members from three allopathic medical schools from the mid-Atlantic region or contingent states who were either classified as basic scientists or academic physicians. (There are a total of five allopathic medical schools in

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Virginia and West Virginia). The study excluded collateral faculty with only administrative responsibilities and other allied health faculty members.

Although a total of 12 allopathic medical schools were selected for study from 11 states, only three chose to participate. These original 12 schools were selected based upon their ranking in NIH grant award funding (see Appendix B). The middle Atlantic region of the United States includes seven states and the District of Columbia. The states include Kentucky, Maryland, North Carolina, Ohio, Tennessee, Virginia, and West Virginia. The state of Delaware has no medical school. The Uniformed Services University of the Health Sciences in Bethesda, MD, was not listed on the NIH awards list and is excluded from analysis (Office of Extramural Awards, NIH, 2008).

Schools 1 and 3 were classified in the lowest of three categories for NIH funding and School 3 was categorized in the middle rank for NIH funding. NIH grant awards were thought to be an appropriate indicator of targeted funding. Following additional state and federal government budget data analysis, it was found that the school categories remained the same. The dollar amount of NIH grant awards was considered an appropriate indicator of targeted funding because NIH is the primary federal government source for medical research funding (NIH, 2008). NIH grant award data were taken from the U.S. Health and Human Services website (Office of Extramural Research, NIH, 2008) (See Appendix B).

The total NIH awards for medical schools for fiscal years 2006 and 2007 were calculated for each school in this region. Although a minority of schools moved in ranking position between fiscal years 2006 and 2007, they remained in the same category

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of high, middle and low for both fiscal years. There was an average award difference of $47,521,971 between the lowest and middle categories and $281,732,848 between the middle and highest categories for 2006. An award difference of $329,254,818 was found between the highest and lowest averages of the medical schools for 2006.

For 2007, the average dollar difference, for 2007, between the lowest and middle ranks was $44,533,464; the average difference between the middle and highest ranked medical schools was $273,681,896, and the average difference between the highest and lowest was $318,215,360 for 2007. Analysis of these data indicated that variance in funding existed among the three medical school funding categories in terms of federal NIH funding of lowest, middle and highest.

Sampling

A total of 12 allopathic medical schools in the Middle Atlantic United States region were selected for inclusion in the study based upon their ranking in NIH award funding (see Appendix B). Although a minority of schools moved in ranking position between fiscal years 2006 and 2007, they remained in the same category of high, middle and low for both fiscal years. The four lowest ranked medical schools for NIH awards were drawn from the states of Tennessee, Ohio, Virginia and North Carolina. They are: East Tennessee State University in Johnson City, TN; Northeastern Ohio University in Rootstown, OH; Eastern Virginia Medical School in Norfolk, VA, and East Carolina University in Greenville, NC. The four medical schools that ranked in the middle were drawn from the states of Kentucky, Tennessee, Virginia and Washington, D.C. They are:

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University of Louisville, in Louisville, KY; University of Tennessee in Memphis, TN; Virginia Commonwealth University in Richmond, VA, and Georgetown University in Washington, D.C. The four schools that ranked highest for NIH awards were drawn from the states of Ohio, Tennessee, North Carolina and Maryland. They include: Case Western Reserve University in Cleveland, OH; Vanderbilt University in Nashville, TN; Duke University in Durham, NC, and Johns Hopkins University in Baltimore, MD (Office of Extramural Awards, NIH, 2008). (See Appendix A. U.S. Medical Schools in the Mid-Atlantic region).

When combining the two fiscal years together, the average award for the lowest ranked four medical schools was $13,681,163, for the middle award group was $197,792,032, and for the highest four medical schools was $313,474,218. The difference between the lowest and middle rank was $184,110,870, between the middle and highest ranked was $129,363,348 and between the lowest and highest ranked was $313,474, 218. Analysis of these data indicated that variance in funding existed among the three medical school funding categories in terms of federal NIH funding of lowest, middle and highest.

Although targeted funding can include funding from federal government, state government, alumni, private individuals and foundations, and corporate/industry sources, only federal and state financial data were used in the study because schools declined to provide detailed financial data. Originally, the medical schools were asked to complete a detailed financial data worksheet for the fiscal years 2005-08, but they declined stating inadequate personnel resources and time to provide the information. Thus, the researcher was not able to identify funding from corporate, alumni or private donors.

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The researcher collected financial data information on the three medical schools that participated from the following sources: revenue data from the Association of American Medical Colleges (AAMC, 2009, Medical School Revenues); grant awards amounts from the NIH (NIH, U.S. Department of Health and Human Services, 2009, Award data for individual organizations for fiscal years 2005-2008); state government budget bills of the Commonwealth of Virginia and West Virginia for fiscal years 2006-2008 (West Virginia Legislature, 2009, Budget Bill 2006, 2007, and 2008; Virginia General Assembly, 2009, Budget Bill 2006 Special Session 1, Budget Bill 2007, and Budget Bill 2008), and congressional earmark information from *The Chronicle of Higher Education*. Specific allocations from congressional earmarks from the U.S. House of Representatives were only available for the fiscal year 2007-08, the year the House of Representatives passed legislation requiring that earmarks be made publicly available. (The Senate did not pass similar legislation.) Only school 1 received a congressional earmark for medical education (Brainard & Hermes, 2008, March 28).

Using these federal and state government sources, a three-year average dollar amount was then calculated for fiscal years 2005-2008. This average was then divided by the number of faculty per medical school to provide a targeted funding dollar amount per faculty. The targeted government funding amount for school 1 was $34,000, for school 2 was $84,000 and for school 3 was $36,000. Because only three schools chose to participate that fell in only two of the three NIH grant fund ranks, these data were not used to calculate the independent variable of targeted funding. Instead, this variable was collected on the inventory itself. Schools 1 and 3 fell in category 1 for lower rank and

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school 2 in middle rank for NIH grant awards. Only two schools in the lowest rank and one in the middle chose to participate). See Table 1 for detailed information on targeted funding.

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Table 1.

Targeted funding amount for each medical school

School	2006	2007	2008
1	$5,907,185	$6,808,645	$ 6,640,692.00
2	$58,272,362	$59,797,550	$76,035,001.00
3	$6,576,070	$6,211,446	$ 6,559,939.00

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The study utilized stratified random sampling for selection of study participants for two of the three medical schools. One medical school chose to send the survey to all faculty. Faculty were stratified by disciplines of either academic physician or basic sciences faculty (Allison, 1999; McMillan & Schumacher, 2001).

Instrumentation

The independent variable of targeted funding from government was measured by the question: Are you partially or fully funded by an external grant? Choices included: No or yes. In addition, the researcher developed a targeted funding category variable based on school targeted funding amounts. Schools 1 and 3, with lower targeted funding, were designated category 1 and assigned a value of 0, and school 3, which was in the middle level for targeted funding, was designated as a category 2 and assigned a value of 1. This variable was determined by the detailed federal and line item appropriation, congressional earmark and NIH grant funding data available.

The first sheet of the academic inventory contained information on the other independent variables that were collected (see Appendix C. Academic Freedom Inventory). The independent variables that were collected were nominal in nature, that is, they described a characteristic and were assigned a value, but the value did not measure an amount of the characteristic. They also were categorized dichotomously, with either a value of 1 or 0. The independent variables were gender, race, tenure status, tenure track, academic rank, U.S. citizenship, medical discipline (generalist vs. specialist), educational

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discipline (physician vs. basic scientist), administrator (whether they had an administrative title such as dean or chair), and targeted funding (designated by whether or not the faculty member received support from a grant). Allison (1999) suggests that it is appropriate to include these types of dummy variables in a multiple regression analysis. A dummy variable is used to describe an independent variable that cannot be measured numerically but is qualitative (McClave, 1997, p. 568).

The values for the nominal variables were as follows: For gender, males were coded as 1, females 0; for tenure status, tenured faculty were assigned a 1 and non-tenured faculty a 0; for tenure track, faculty on the tenure track were coded as 1 and collateral track faculty were assigned a value of 0; for educational discipline, physicians were assigned a value or 1 and basic scientists a 0; for citizenship, U.S. citizens were assigned a value of 1 and non-citizens were 0; and those receiving support from a grant (targeted funding) were assigned a value of 1 and those not a value of 0. Respondents also were given more than two choices for the following independent variables, which were then transformed into dichotomous nominal values. Those variables and their assigned values follow: Although the variable of AAMC race has 13 categories of races/ethnic groups, based upon the AAMC medical minority classifications (AAMC, 2007), this variable was changed into a dichotomous variable. Faculty who were not a medical minority were assigned a value of 1 and medical minorities were assigned a 0.There also was a no answer option that was assigned a value of 1, as that was the choice with the most responses. The variable of academic rank had the following choices: clinical instructor, professor, associate professor, assistant professor. That variable was

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transformed into a dichotomous variable, which divided the two values by high rank, which included professors and associate professors designated as 1, and all other lower ranks, such as assistant professor or clinical instructor, as 0. The variable of administrator had the following choices: dean, chair, president or vice president, section chief, or other. All were assigned a value of 1 except for other, which was given a 0 value.

Missing values were assigned values for the following variables: Citizenship, targeted funding, tenure track, tenured, rank, gender and discipline (physician or basic scientists. For the variable of race, there were no missing values, but six respondents chose the no answer option. Missing values were assigned to the value for which there were the most responses. For gender, missing values were assigned a 1 for male; for administrator, missing values were assigned a 0 designating not an administrator; for tenure, missing values were assigned a 0 for not tenured; for tenure track, missing values were assigned a value of 1 for tenure track; for targeted funding, missing values were assigned a value of 0 for not receiving salary support from a grant; for citizenship, missing values were assigned a value of 1 for U.S. citizenship, and for discipline, missing values were assigned a 1 for academic physician. For race, those who chose the no answer option, they were assigned a value of 1 indicating they were not a medical minority. See Table 2. Missing values.

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Table 2.

Missing Values

Variable	Number of Missing Values
Educational Discipline (physician or basic scientist)	8
Academic Rank	7
Tenure	7
Tenure track	0
Administrator	75
Gender	9
Citizenship	14
Race	0 (6 selected no answer option)
Targeted funding	9
Medical discipline	73

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The large number of missing values for the administrator category is thought to stem from the lack of a precise choice for those faculty who did not consider themselves administrators. There was an "other" category, which 24 respondents chose. One assumption that has been made is that in the absence of a suitable option, many respondents who did not consider themselves administrators simply chose to not answer the question. Given that most faculty are not administrators, and that 41 respondents were not on the tenure track, it is likely that the missing values are from faculty without administrative titles, thus justifying the recoding of the missing values to the category for faculty who are not administrators. For the medical discipline variable of generalist, specialist or combined, there was a large number of missing values. Nearly half the sample were basic scientists. Thus, this variable was excluded from analysis as it did not contain enough samples to justify multiple regression. Review of the data did not find trends or patterns significant enough to justify inclusion in the models.

Medical educators for the most part fall into two disciplinary categories: 1) basic sciences faculty, who are not physicians but who teach medical students core subjects typically in a lecture hall format, and 2) physician faculty, who may teach residents and students in lecture hall, clinic or hospital settings and who also carry patient care responsibilities. Both groups typically are charged with administrative and research and publication responsibilities. Basic sciences faculty are an integral part of any academic medical institution, and help prepare medical students by teaching foundation science courses in subjects such as physiology, biochemistry. Since they are members of the

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academic medical community who serve on governance committees, conduct research, teach students, and participate in curricular decisions in academic medicine, it was thought that they should be included in the study. The two disciplines have different responsibilities, however, and these differences may impact their perceptions about academic freedom. Basic sciences faculty have no clinic responsibilities and may have little interaction with teaching hospitals or research projects involving human subjects. At the same time, many of the same trends, particularly in respect to the downward trend of tenure track positions, appear to be affecting basic sciences the same as other disciplines in higher education (Liu & Mallon, 2004; Bradley, 2004; AAUP, 2008). These differences justified the inclusion of an educational discipline independent variable. The samples also were stratified for two schools by the variable of physician or basic scientist.

Citizenship status is considered relevant to academic freedom as the literature has suggested that national security interests may hinder academic freedom for foreign faculty members. The literature notes incidents where qualified foreign students, residents and faculty have been denied admittance to school, employment or have been discouraged in other academic endeavors, such as access to technology, in the name of national security (Kless, 2004; Keel, 2004; Field, 2006). O'Neil (2006) also has expressed concern about loyalty oaths being required of faculty in Ohio. The rationale for the oaths has been national security concerns and is reminiscent of the anti-communist loyalty oaths required of faculty during the McCarthy era of the 1950s (O'Neil, 2006).

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This variable of citizenship was therefore included to ascertain if the lack of citizenship predicts faculty members' perceptions about their academic freedom.

The AAUP justifies the need for tenure in order to give faculty the security needed to be able to challenge conventional ideas, present controversial thought, and pursue and teach the objective truth through research (AAUP, 2006, pp.3-7). Data from a study conducted by the AAUP indicated an inverse trend since the 1970s of a decrease in tenure track positions with an increase in non-tenure track positions (AAUP, 2008). In a study of all degree-granting institutions, the AAUP noted that full-time tenured faculty represented 36.5% of all faculty in 1975. By 2005, that percentage had dropped to 21.8%. At the same time, the percentage of part-time, non-tenure track faculty rose from 30.2 % in 1975 to 48% in 2005 (AAUP, 2008).

Similarly, Swindle (1995) found, in a quantitative study of faculty perceptions of academic freedom, statistically significant differences between perceptions of tenured and non-tenured faculty, with non-tenured faculty perceiving significantly less academic freedom (Swindle, 1995). In addition, data from two qualitative studies at separate institutions suggest that faculty still value tenure despite these trends (Adam, 2004; Goodell, 2005).

The AAUP justifies tenure as crucial to the protection of academic freedom (AAUP, Appendix I. 1915 Declaration of Principles on Academic Freedom and Academic Tenure, 2006), yet tenure track positions have declined dramatically over the past 20 years (AAUP, 2008). In addition, it was found that non-tenured faculty in one quantitative study perceived themselves to have statistically significant less academic

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freedom than tenured faculty (Swindle, 1995), and two qualitative studies found that faculty still value academic freedom and tenure (Adam, 2004; Goodell, 2005). Given the trends reported in the literature and related research, it is appropriate to include the variables of tenure status and tenure track to determine if tenure or tenure track are predictive of faculty perceptions about academic freedom in medical education.

The problem of attracting and retaining minority, foreign and other ethnic groups in proportion to the general population continues to remain a persistent problem for medicine. According to the AAMC, the problem has persisted, despite financial and admissions incentives offered by the AAMC and colleges through specialized programs to recruit more students, residents and faculty from medical minority groups. There has been speculation that minorities find medicine as a profession less receptive than other professions and thus qualified potential applicants shy away from careers in medicine and toward careers where they believe they will be more welcome. Thus, medical minorities might perceive less academic freedom than non-medical minorities or foreign faculty who are not U.S. citizens. This variable has multiple categories and is nominal in nature. For the purposes of analysis, race/ethnicity questions had four categories: white, black, Asian ethnic groups, and other (AAMC, 2008; AAMC, 2007). Inclusion of the race category was justified to determine if race was predictive of faculty perceptions about their academic freedom.

Academic rank in medicine also may affect faculty perception about their academic freedom. Some research suggests that rank, particularly senior administrative positions, may affect perceptions of academic freedom (Jones et al., 2005). Academic

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ranks that are included in the study have four categories: professor, associate professor, assistant professor, and instructor. The purpose of including academic rank as a control variable was to ascertain if rank correlated more with perceptions of academic freedom than the research variable of targeted funding or with tenure.

The need for more generalist physicians, identified in the 1980s, spurred the Robert Wood Johnson Foundation, the AAMC, the federal government and state governments in the 1990s to create and fund programs like the Generalist Physician Initiative to enhance the generalist core curriculum of medical education and to increase the numbers of graduating residents entering primary care careers. One theory for the decrease in generalist career choice was allure of more money and greater prestige in specialized medicine on the basis of research funding. At the same time, some physicians considered this government funding of medical curricular change –the Generalist Physician Initiative which was funded in the 1990s -- to be an infringement of faculty academic rights to control the curriculum (Willett et al., 2003; Grogan, 1998; Cohen & Whitcomb, 1997). The two conflicting trends of government research dollars targeted for specialized medicine and government funding for curricular change to enhance generalist medical education may affect faculty member perceptions of academic medicine differently, dependent upon whether they consider themselves generalist physicians or specialist physicians.

Gender also may affect faculty perceptions about academic freedom. Bickel, Croft and Marshall reported in 1996 that, 20 years earlier, the major challenges for women in the field of medicine were educational access and achieving a faculty position. By 1996,

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the issue of access to medical education for women had significantly declined as evidenced by the numbers of women attending medical school, but the attainment of tenure or tenure track positions and leadership opportunities still presented particular challenges for women (Bickel, Croft & Marshall, 1996). By 2006, the AAMC reported that while strides had been made in the representation of women in faculty and resident positions, they were still under represented in positions of senior leadership (Magrane & Lane, 2006). By 2007, Magrane et al., (2007) reported that only 6 % of women attained the rank of associate professor and 4 % of full professor, while 20 % of full professorships and 15 percent of associate professorships were held by men, despite the fact that almost half of the medical school classes were represented by women (Magrane et al., 2007). Given the low numbers of women represented in tenure track positions, and in positions of senior leadership, gender may be a factor that affects perceptions of academic freedom.

In addition to the independent variable of targeted funding, the variable of administrative position was collected in order to examine any effects from bias. Senior administrators and those charged with departmental administrative responsibilities might be held responsible for attracting targeted research and education funds and thus may be biased in favor of this practice. Administrators' liaison roles with political interests and hospital market interests on behalf of the institution might also bias them in favor of government and corporate interests. In addition, administrators may have greater knowledge about issues affecting institutional autonomy than faculty members not in administrative roles given their work with external political interests.

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The dependent variable of academic freedom was measured by an inventory designed specifically for this study (see Appendix C). Additional benefits to using a quantitative inventory to examine the health of academic freedom in medical education include the following:

- Reduction of researcher bias
- The ability to separate and target specific components of academic freedom for analysis, such as self-governance separately from other components such as institutional autonomy
- The ability to examine relationships with variables that might impact faculty attitudes more than the independent research variable
- The ability to control for the other independent variables
- Greater confidentiality and convenience by using anonymous e-mail surveys over individual interviews
- Greater time efficiency than individual interviews, which might increase participation rates (McMillan & Schumacher, 2001; see also Huck & Cormier, 1996).

The five rights to academic freedom identified as most threatened in the literature were measured on the inventory according to the rights described by the AAUP (AAUP, 2006, pp.3-11). These academic freedom categories include self-governance, institutional autonomy, and freedoms to research, speak and teach (see Appendix D. Academic Freedom Index) (AAUP, pp. 3-1). Each category also included one positive statement affirming the health of that particular academic freedom. This question was reverse

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ordered to address the demand effect and strengthen reliability of the instrument (Mitchell & Jolley, 2004). That is, a strongly agree response on all questions but the overall academic freedom assessment question indicated that a respondent believed his or her academic freedom to be inhibited. The five response categories were: strongly disagree, disagree, neutral, agree, and strongly agree. Each question was assigned a number from 1 to 5, with 1 representing strongly disagree, 5 representing strongly agree, and 3 neutral for all but the overall academic freedom assessment question in each category.

Overall high scores on an inventory category were interpreted that the faculty member perceived his or her academic freedom to be inhibited while a low score was interpreted as the faculty member considered his or her academic freedom to be healthy at that institution for all but one academic freedom measured. For freedom to teach, the questions were written and ordered such that high scores indicated a perception that freedom to teach was healthy while low scores indicated that academic freedom was inhibited. The researcher changed this order in order to address internal reliability as a check to ensure that the respondent had considered the questions.

The unit of analysis was the faculty member's score. There were a total of eight questions per academic freedom category included on the inventory. Seven of the questions addressed each of the threats identified in the literature as threatening academic freedom in medical education and research: national security, accountability, government interests, corporate interests, hospital/market interests, the decrease in the numbers of tenure track positions, and leadership's need to pursue external funding (Kapp, 2006;

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Hamilton, 2002; Monastersky, 2007; AAUP, Statement on Corporate Funding of Academic Research, 2006; Angell, 2000; Brainard, 2005; Brainard & Hebel, 2007; Chu, 2005; Glantz, 2005). (See Appendix E. Academic Freedom Threats Index).

High scores for all but the one question assessing the overall health of the particular academic right in each category was interpreted as low in perception of academic freedom for that category. For each academic right, a statement was included asking if that right was inhibited by an issue described as threatening to academic freedom from the literature (Kapp, 2006; Hamilton, 2002; Monastersky, 2007; AAUP, Statement on Corporate Funding of Academic Research, 2006; Angell, 2000; Brainard, 2005; Brainard & Hebel, 2007; Chu, 2005; Glantz, 2005). These seven academic freedom threats include: government financial interests, national security interests, role of leadership as fund raiser, decrease in tenure track positions, hospital market interests, educational accountability, and corporate interests (Kapp, 2006; Hamilton, 2002; Monastersky, 2007; AAUP, Statement on Corporate Funding of Academic Research, 2006; Angell, 2000; Brainard, 2005; Brainard & Hebel, 2007; Chu, 2005; Glantz, 2005). (See Appendix E. Academic Freedom Threats Index).

Procedures

The independent variable of targeted funding was determined by a question on the inventory itself, as the medical schools declined to provide the detailed budget information necessary to calculate a targeted funding variable. In addition, only three medical schools participated which limited variance among the financial data that was necessary to use targeted funding dollar amount per faculty member adequately in the

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multiple regression equation. Instead, the researcher created an independent variable for school funding category. This amount was calculated based upon government line item appropriations and NIH funding amounts. A targeted funding amount per faculty member was calculated for all three schools. Schools 1 and 3 were categorized as 0 for low in targeted funding, and School 2 was categorized as 1 for the middle ranking for targeted funding. None of the schools in the highest group for NIH funds agreed to participate.

The Institutional Review Board (IRB) at VCU reviewed and approved the study's purpose and procedures for human subject protections. A pilot study was then conducted with six medical school faculty members, who included three academic physicians and three basic scientists, to determine response time, assess the effectiveness of questions and overall quality of the instrument. After taking the inventory, participants in the pilot study were asked to critique the instrument for its content validity, including the quality, clarity and accuracy of questions in measuring the construct of academic freedom. Participants in the pilot study were given the opportunity to comment on each question. Feedback was minimal. Time given by the pilot study subjects for taking the survey ranged from 5-20 minutes. The faculty recruitment letter was then revised to provide a total time estimate for taking the survey at 13 minutes. None of the participants chose to discuss their feedback via interview as is recommended in the literature, although they were invited to do so (McMillan & Schumacher, 2001).

Deans or their designees at 12 allopathic medical schools included in the study were sent a recruitment letter via e-mail requesting institutional participation (See Appendix G. Institutional Recruitment Letter). That recruitment letter described the

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study's purpose, the procedures to protect human subjects, requirements for participation, the handling of data, and consent. The medical schools declined to participate, stating concerns about the time gather the budget data, some schools declined stating concerns about faculty confidentiality by sharing e-mail addresses, and several expressed concern that the true purpose of the research was not clear. A second recruitment letter was then created that provided further information about the research purpose and included an additional option for participation. That is, institutions could choose to send the faculty the invitation letters and web links using their own e-mail list serve if they did not wish to share faculty e-mail addresses. The request for budget data was also dropped from the second request. Schools 1, 2 and 3 then agreed to participate.

Once institutional approval was received via e-mail, the faculty recruitment letter was sent via e-mail to all medical school faculty selected by stratified random sampling by discipline (basic scientists and academic physicians) in schools 2 and 3. (See Appendix F. Faculty Recruitment Letter). School 1 sent the invitation to all faculty. The link to the web-based survey was included in the letter. The on-line survey was designed using the software program Inquisite, web-based survey development software, which was available from the Office of Assessment in the VCU School of Education and VCU Technology Services (Office of Assessment, 2009; VCU Technology Services, 2009). (See Appendix C for the Academic Freedom Inventory).

Invitations were sent by the VCU School of Education's Office of Assessment, which also collected and stored the data on a password-protected, secure server at VCU. E-mail addresses and responses were stored separately on the data set (Office of

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Assessment, 2009). Faculty members included in the original pilot study were excluded from analysis as is recommended in the literature (McMillan & Schumacher, 2001).

The purpose, instructions and assurances of confidentiality were addressed in the cover letter, including assigning a number to each survey instead of identifying by name; maintaining data on a password protected database at VCU to which only the researcher has access; and publishing results only in aggregate form (see Appendix F. Faculty Recruitment Letter). In addition, the researcher's name, address and phone number were made available for questions or concerns about the study. There were three response cycles. After the initial recruitment letter was sent and a five-seven day response time passed, a second and third requests for participation were sent, again separated by a five-seven day response time. For schools 2 and 3, only faculty members who had not responded were sent the second or third request. For school 1, all faculty were sent all requests as that institution controlled the recruitment process.

Respondents interested in viewing results were asked to provide their e-mail addresses directly on the inventory. E-mail addresses were destroyed following completion of the study. Completion of the survey and academic freedom inventory and submission to a password protected and secure web site at VCU indicated agreement of the respondent to the conditions of participation in the study, including issues of confidentiality and use of data.

Data Analysis

Faculty responses for the dependent and independent variables were entered and analyzed using the Statistical Package for the Social Sciences (SPSS) 17 computer

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program available through the VCU Technology Services. E-mail addresses and responses were not linked as to ensure anonymity of responses. All variables were measured by responses to the Likert scale academic inventory, which were entered and scored into a data set on SPSS (VCU Technology Services, 2008). The total faculty score was treated as the unit of analysis. By combining the inventory questions data together using factor analysis, we converted the ordinal data into interval data. (Huck & Cormier, 1996). By treating data in this manner, it was then appropriate to use the data in multiple regression analysis (Allison, 1999).

The inventory included a Likert scale with five response categories ranging from strongly disagree, neutral and strongly agree (Mitchell & Jolley, 2004). Multiple regression analysis was then used to analyze the research questions by testing for any relationships between the dependent variables that addressed five rights to academic freedom and the independent research variable of targeted funding (as measured on the inventory) as well as other independent variables thought to inhibit perception of academic freedom. McMillan and Schumacher (2001) recommend that multiple regression is justified "whenever researchers are interested in the relationship of several independent variables combined with a dependent variable. Multiple regression also allows researchers to 'control' for selected variables to determine the relationship between the other independent variables and the dependent variable" (McMillan & Schumacher, 2001, p. 295).

In this study, the purpose of using multiple regression analysis was predictive, rather than causal (Allison, 1999). This method of analysis enabled the researcher to

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analyze the research question, controlling for the other independent variables of educational specialty, administrator, citizenship, tenure status, tenure, gender, race and rank in order to see which, if any, of these independent variables could predict scores for faculty perception of academic freedom.

By using multiple regression analysis, these dependent variables and the other independent variables were analyzed with the independent variable of primary interest – targeted funding -- to form a multiple regression prediction equation. Values on each of the variables were placed in the equation and each was weighted by a regression coefficient to determine the contribution of each to predicting faculty perception of academic freedom. This enabled the researcher to compare the regression coefficients after converting them to beta weights for comparison (McMillan & Schumacher, 2001, p. 295).

The formula for a general linear model is Y=a+bx1+bx2…, where y is the dependent variable of perception of academic freedom, when there is no independent variable such as targeted funding present (or 0 value for targeted funding)+ b, which is the slope or the difference when the independent variable is added (Mitchell & Jolley, 2004). Ordinary least squares is the method typically used to get values for regression coefficients. In order to reduce error, the most widely used method is the least squares principle, which states to "choose coefficients that make the sum of the squared prediction errors as small as possible" (Allison, 1999, p. 12). In order to reduce error, the researcher employed the "least squares principle to minimize the sum of squares of the prediction errors (SSE) (Lewis-Beck, 1980, p. 48). Least squares criterion method

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chooses coefficients that make the sum of the squared prediction errors as small as possible in order to find numbers that give the best predictions of the dependent variable. If y is perception of academic freedom, it equals the value of academic freedom when there is 0% of targeted funding (or any other independent variable present) or a + b, which is the slope or difference with each incremental decrease or increase of the independent variable (Mitchell & Jolley, 2004).

To calculate least squares in order to minimize error, the program squared the error between the predicted value and the actual value for all cases included in the study and arrived at a sum of all squared errors (Lewis-Beck, 1988). This equation gave the predicted score for perception of academic freedom with each increase in the independent variable. The mean score on the inventory was subtracted from each true score, the result was squared and then those squares added over the total. This produced a regression sum of squared errors. Then, the program divided the smaller sum of squared errors by the larger sum in order to produce an *R2*. Therefore, *R2* = sum of squared errors (regression) over the sum of squared errors (mean). By using the independent variables to predict the dependent variable, the calculations were designed to yield a reduction in the prediction errors, compared with just using the mean to predict the dependent variable.

The researcher then calculated confidence tests at the 95% level in order to test the null hypothesis. The degrees of freedom for the multiple regression analysis were dependent upon the sample size and the number of independent variables (Lewis-Beck, 1980). Using SPSS, the researcher then computed the *R2* , coefficient of multiple determination, because the dependent variable data were combined together, thus

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providing a greater range for the regression index. (Since using the Pearson *R* alone can inflate the importance of any relationships, the researcher employed *R2*) (Lewis-Beck, 1988). This measure of how well the predictors predict the outcome measure is called the multiple correlation-squared or *R2*. In order to determine whether the regression equation was able to predict scores on the research variable, an *F* test was calculated to determine if any relationships found were statistically significant or random chance. That value was determined prior to the study to be set at less than 0.05 to evaluate the statistical significance (Mitchell & Jolley, 2004).

The dependent variable was measured by a category of questions that addressed issues identified as threats to academic freedom in the literature under each academic freedom right. These issues are described in Appendix E. Academic Threats Index. The academic freedom rights studied included: institutional autonomy, self-governance, freedom to speak, freedom to teach, and freedom to research (and publish) the objective truth. The academic freedom threats studied included: national security interests, corporate interests, government funding of research, educational accountability, hospital market interests, decrease in tenure track positions, changing role of the presidency (Kapp, 2006; Hamilton, 2002; Monastersky, 2007; AAUP, Statement on Corporate Funding of Academic Research, 2006; Angell, 2000; Brainard, 2005; Brainard & Hebel, 2007; Chu, 2005; Glantz, 2005).

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Delimitations

The study was limited to faculty from three medical schools in the mid-Atlantic region of the United States. The study included only schools that are publicly funded. The study was focused only on academic medicine, and not other disciplines in higher education, such as English, or education.

Faculty members with neither research nor teaching responsibilities, such as administrative faculty, were excluded from recruitment. Faculty from other programs within the medical schools, such as dentistry, nursing, or pharmacy also were excluded; however, clinical/physician faculty members who may not have had teaching, research or administrative responsibilities, but were considered faculty members by their schools, were included and may have indicated that they were collateral, clinical instructors. This study did not include students, residents, parents or other stakeholders, or faculty members who only have administrative responsibilities but no teaching, patient care or research responsibilities.

Limitations

Academic freedom is a complex research question that cannot be examined comprehensively through one study relying solely on one methodology. There may be aspects of the research question that were not included, or could not be addressed adequately in a written instrument, thus possibly reducing construct validity of the instrument (Huck & Cormier, 1996). Because of the complexity of academic freedom, it is possible that there were issues that impact academic freedom but were not be included.

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In addition, the instrument itself may have decreased the response rate due to its length. Medical educators juggle competing demands from patients, hospital and clinic administrators, teaching, and research, which also might affect response rate (McMillan & Schumacher, 2001).

The primary independent variable of interest – targeted funding – may not have been measured accurately by the one question on the inventory regarding grant support of salary. It was originally designed as a control variable for the effects of any bias from respondents who receive such support. The researcher assumed faculty supported by a grant would hold a bias in favor of targeted funding. The medical schools declined to provide the detailed financial information necessary to accurately describe this variable for each school. In addition, because only three schools participated, there was not enough variance among the schools in terms of the targeted funding dollar amount per faculty member after analysis of state government, congressional earmark and NIH grant awards. Thus, the question on the inventory was used as the independent variable of targeted funding.

The researcher used electronic communication as a means to disseminate the inventory and collect data as it allowed for anonymous responses. It also was considered more convenient, as faculty could choose when to respond (McMillan & Schumacher, 2001; see also Huck and Cormier, 1996). In order to encourage participation, the researcher asked each dean or his or her designee to provide a cover letter encouraging faculty support, while emphasizing the confidential nature of the survey instrument. Only

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school 1 provided cover a cover letter of support when the school sent the recruitment letter to faculty via e-mail.

Researcher bias in any quantitative research study is a threat to its internal validity (Huck & Cormier, 1996). The researcher previously worked in medical education for eight years and was a currently a doctorate student in education; thus, she may inherently have held certain assumptions about the research question that may have been evident in the survey questions. In addition, no one on the research team is, or has ever been, an academic physician (Huck and Cormier, 1996). Solely relying upon the written literature to identify and create questions to capture the construct of academic freedom holds inherent threats to the internal validity of the instrument. Finally, reliability of the inventory is a concern. There was only one small pilot study done, not to be followed by a larger pilot study before implementation, and little feedback was received. Inter-reliability among test questions also was not tested. Tests for reliability were not conducted (McMillan & Schumacher, 2001).

To offset some of these limitations, a pilot study was conducted of a small sample of academic physicians and basic scientists (six) at one of the schools included in the study. They were asked to provide feedback and criticism of the academic freedom inventory; however, little feedback was received. These academic physicians and scientists were excluded from the larger study.

Originally, the researcher had described the research purpose as simply being an assessment of medical education, but some schools declined to participate, stating that the purpose was not clear. The researcher then sent another request for participation to the

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institutions which fully described the purpose as academic freedom and revealed the purpose of the study in the faculty recruitment letter as well. Because the purpose was made clear, the researcher was not able to address error from the demand effect (Mitchell & Jolley, 2004, p. 93). Respondents may have responded to what they thought the researcher wanted instead of their true thoughts and beliefs about academic freedom.

The inventory was distributed only once during a four-month period of time during late summer and early fall semester of 2009 and the inventory was not repeated, thus the degree to which the instrument accurately and reliably measured the constructs of academic freedom are a concern. A second pilot study with a larger number or a pilot study at more than one school in the study, as is generally recommended to address issues of internal reliability, was not conducted (McMillan & Schumacher, 2001).

The study examined the research questions at only three medical schools located within one region of the United States – the Mid-Atlantic region--thus reducing the ability of the researcher to generalize findings to other medical schools outside the Mid-Atlantic region. Because of the low response rate, findings had to be interpreted cautiously even for the schools included in the study (McMillan & Schumacher, 2001).

Finally, this type of analysis, correlation, can not be used to make any causal statements, as correlation does not equate with causation. Correlation research can explore relationships, but cannot explain why the relationship exists. Correlation research can be valuable, however, for describing predictive relationships, provided a representative sample is used (Mitchell & Jolley, 2004; McMillan & Schumacher, 2001).

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Chapter IV. Findings

A multiple regression analysis using the statistical package SPSS 17 was conducted to test if there was a relationship between targeted funding and faculty perception of academic freedom in medical education, controlling for other independent variables thought to affect academic freedom (SPSS, VCU, 2008). The literature has suggested that targeted funding of research infringes upon faculty academic freedom (Conference on Academic Values in the Transformation of Academic Medicine, AAUP, 1999; Brainard, 2006; Steinman & Baron, 2007). It also is thought to impact medical student education, residency training and professional continuing medical education (Dievler, 2002; Packer, 2005; Mangan, 2004).

In addition to targeted funding, the literature has raised concerns about other issues or trends that may impact academic freedom, such as government intrusion in the name of national security interests following the 9-11 attacks on New York City (Monastersky, 2002; Monastersky, 2007). Given this concern, citizenship was included as an independent variable. The underrepresentation of racial minorities in all areas of medicine and the underrepresentation of women in leadership and tenure track positions are of particular concern to the medical professorate (AAMC, 2007; AAMC, 2008); thus justifying the inclusion of race and gender as independent variables. Given the trend toward academic capitalism with its emphasis on the generation of clinical revenues, the professorate also has raised concern about the impact of hierarchical corporate decision making upon faculty governance (Jones et al., 2005; Conference on Academic Values in the Transformation of Academic Medicine, AAUP, 1999). This issue justified the

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inclusion of an administrator variable. Administrators were faculty with administrative titles such as chair, dean, assistant dean. Finally, it was thought that the reductions in tenure track positions and increase in part-time or collateral track positions also might affect academic freedom (Liu & Mallon, 2004). These independent variables also were included for analysis using multiple regression analysis.

This study, then, focused upon the following research questions:

1) Is there a relationship between targeted funding, when controlling for other independent variables, and faculty perception of academic freedom at their institutions?

2) Is there a relationship between gender, when controlling for other independent variables, and faculty perception of academic freedom at their institutions?

3) Is there a relationship between being a citizen, when controlling for other independent variables, and faculty perception of academic freedom at their institutions?

4) Is there a relationship between being an administrator, when controlling for other independent variables, and faculty perception of academic freedom at their institutions?

Description of the Sample

Basic sciences and physician faculty at American allopathic medical schools in the mid-Atlantic region and contingent states were selected for inclusion in the study based upon their schools' ranking for NIH grant awards funding (See Appendix B).

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Findings from the study cannot be generalized to medical schools in the Mid-Atlantic region as no schools in the high category were successfully recruited and the sample number was too low to be considered representative of this population. In addition to the limitation that only three of the 12 medical schools contacted were actually recruited, another limitation was the sampling strategy and low response rate.

The researcher used stratified random sampling for two schools, stratifying by physician and basic scientist disciplines. Because school 1 chose to send the survey to all faculty at its school of medicine (a stronger method for sample selection than random sampling), numbers for the other schools were adjusted accordingly. The sampling strategy differed by school. For schools 1 and 3, all basic scientists were selected for study because their total numbers fell below 100, while for school 2, the researcher selected a random sample of 100 from both physician and basic sciences faculty. McMillan & Schumacher (2001) recommend that at least 100 cases be selected when stratified random sampling is utilized. For school 1, all basic sciences and physician faculty were selected as that institution chose to send out the faculty invitation letter using an institutional e-mail list serve.

The sample sizes drawn for these populations did not meet the criteria for 5% at the 95% confidence level. The physician faculty sample from school 2 was an under-representation (100 sampled from a total population of 470 academic physicians). Mitchell and Jolley (2004) recommend that a sample of 217 be drawn for a population of 500 at the 5% confidence level. The total sample size drawn of 628 for both basic

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scientists and physicians, however, met the 5% sampling error criteria for the total faculty population in aggregate.

Mitchell and Jolley (2004) recommend a sample size of 278 for a population of 1000 to achieve a 5% sampling error (for 95% confidence that the true value falls in that range). The response rate was low, however, and significantly limits the ability to generalize results from the study to the larger population. Of the 130 total responses collected, 57 respondents indicated they were basic scientists and 67 respondents indicated that they were physicians. A total of six respondents did not indicate whether they were basic scientists or physicians. Thus, a total of 130 responses were collected for a population of 1207, which was approximately 10 percent of the total population of interest. The researcher speculates that the lower response rate for freedom to research, teach and speak was due to the fact that these questions were asked at the end of the inventory. Because of its length, some respondents may have tired of taking the inventory. (See Table 3. Sample Size.)

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Table 3.

Sample size

School	Basic scientists	Physicians	Total
School 1	43	236	279
School 2	281	470	770
School 3	42	135	177
Total Population	366	841	1207
Total sampled	185	443	628
Total responses	57	67	124
(Unknown)			(6)
			130

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The dependent variable.

There were five dependent variables analyzed to address each AAUP academic freedom identified as threatened in the literature. Each dependent variable included a group of questions on the inventory asking faculty members to assess if their academic freedom was inhibited. For each category, questions were posed to ask if the following issues affected their academic freedom: national security interests, educational accountability, academic leaders as fund raisers, hospital market interests, the increase in collateral track and decrease in tenure track positions, corporate interests, and government interests. Missing values were excluded from the dependent variable. Table 4 below shows the total response number for each dependent variable.

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Table 4.

Total responses for dependent variables

Faculty governance	Institutional autonomy	Freedom to teach	Freedom to speak	Freedom to research
107	102	94	89	94

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A factor analysis was conducted for each dependent variable, which was then used in the overall multiple regression analysis with the independent variables. The factor analysis converted ordinal data to interval data. Factor analysis allows tests with questions that measure the same construct to "load" together onto one factor. Factor loadings, like *Correlation Coefficients*, range from -1 to 1 (Mitchell & Jolley, 2004, p. 535). Table 5. Factor Analysis correlations includes the results of the factor analysis for each dependent variable.

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Table 5.

Factor Analysis correlations

Freedom of Research	Pearson Correlation	-.482**	.529**	-.394**	-.556**	1
	Sig. (2-tailed)	.000	.000	.000	.000	
	N	91	92	88	89	94
Governance	Correlation	1	[illegible]	[illegible]	[illegible]	[illegible]
	Sig. (2-tailed)		.000	.000	.000	.000
	N	107	99	91	86	91
Autonomy	Pearson Correlation	-.698**	1	-.488**	-.671**	.529**
	Sig. (2-tailed)	.000		.000	.000	.000
	N	99	102	91	87	92
Freedom of Teaching	Pearson Correlation	.510**	-.488**	1	.840**	-.394**
	Sig. (2-tailed)	.000	.000		.000	.000
	N	91	91	94	85	88
Freedom of Speech	Pearson Correlation	.613**	-.671**	.840**	1	-.556**
	Sig. (2-tailed)	.000	.000	.000		.000
	N	86	87	85	89	89

**. Correlation is significant at the 0.01 level (2-tailed).

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Each academic freedom variable was assessed by respondents using an academic freedom inventory that included statements that the specific academic freedom (such as faculty governance) was inhibited by a particular issue (such as national security interests) (See Appendix E. Academic Freedom Threats Index). Choices ranged from 1 to indicate strongly disagree to 3 to indicate neutral and 5 to indicate strongly agree. Questions in all categories but freedom to teach provided negative statements that faculty freedom was inhibited. The exception was the one statement in each category designed to assess the overall health of that particular academic freedom. An example of this overall health statement is as follows: Faculty are free to teach controversial ideas. The type of typical inventory statement used was as follows: The increase in the numbers of non-tenure track positions has inhibited faculty governance. For freedom to teach, most questions were posed positively. An example follows: faculty are free to teach controversial ideas related to their specialties even if they conflict with national security interests.

Each academic freedom category also contained one reverse ordered question to assess the overall general, health of that particular freedom in general. This question was always posed positively, as follows: Institutional decisions are arrived at jointly. A review of the responses to this reverse order question and qualitative feedback indicated consistency in faculty responses. This reverse order strategy was also employed for the freedom to teach group of questions in order to address participant error from the demand or social desirability phenomena, which states that participants may be willing to give the answer that they think the researchers want. One way to reduce this error is to change the

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scale order so that participants do not think the same response is expected each time. In addition, the questions were posed in such a way that respondents indicated their perceptions about other faculty at their institutions-- not themselves necessarily – in order to address error from the effects of social desirability. That is, it may not be socially desirable for some respondents to admit that they feel inhibited in speaking freely, for example (Mitchell and Jolley, 2004, p. 93). With the exception of freedom to teach, high scores in each category indicated that the respondent thought academic freedom was perceived to be healthy. For teaching only, high scores indicated the reverse -- that the academic freedom was perceived as healthy. One statement addressing each issue was included in each academic freedom group or category. (See Appendixes D. and E. for Academic Freedom Inventory Index and Academic Freedom Threats Index).

Independent variables.

The primary independent variable of interest -- targeted funding -- was measured by a question on the inventory: Is any portion of your salary funded by a grant? This was treated as a dichotomous nominal variable (Best & Kahn, 1993, p. 208). Choices were yes, given a score of 1, or no, which was given a score of 0. Missing responses were assigned a value of 0, as most responses were no.

A targeted funding amount per faculty member also was created (See Table 1 in Chapter 3 for total targeted dollar amounts per school for fiscal years 2006-2008). Dollar amounts identified as targeted were divided by the total number of faculty at each school to derive a targeted dollar amount per faculty member. Faculty from school 1 had a targeted dollar amount of $34,292.32, those from school 2 had a targeted dollar amount

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of $84,020 per faculty member, and school 3 was assigned a targeted amount of $36,435.89. There was only a $2,000 difference between schools 1 and 3, which were both assigned to the low targeted funding category. There was a difference of $48,664.00 targeted dollars per faculty member between the two categories, when averaging schools 1 and 3 together. The independent variable of targeted funding was measured by a question on the survey asking whether or not the faculty member had a portion of his or her salary funded by a grant. This measurement strategy was used due to the lack of variance present in the financial data from so few schools participating.

The other independent control variables also were nominal, dichotomous data, not interval data. That is, respondents were coded as either having the characteristic of interest to this study or not. For example, either the respondent had tenure (coded as 1) or did not possess tenure (coded as 0). The following characteristics were assigned a value of 1 in the data set: targeted funding (faculty who received a portion of their salary support from a research grant), upper rank (professors and associate professors), race (those who were not a member of an underrepresented minority in medicine), U.S. citizens, administrator (faculty who held an administrator title or office such as dean or chair,) tenured faculty, males, physicians (with basic scientists coded as 0), and tenure track (faculty who held a tenure track position). Missing values were assigned to the group that already had the most numbers, as the researcher made the assumption that they would fall into this category. Missing values were coded as 1 for discipline (physician), gender (male), race (non-medical minority), citizenship (U.S.), rank (upper rank) and tenure track (not collateral). Missing values were coded as 0 for targeted funding (no

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grant support), and 0 for tenured (not tenured). Missing values for the variable of administrator were coded as 0. This was an exception as the researcher interpreted that since there were more faculty who did not hold administrative titles than administrators in the general population, it was unlikely that the missing values were from administrators. The medical specialty variable of generalist or specialist was excluded because there were so few responses.

Statistical tests.

Multiple regression analysis was conducted in order to examine the relationship between faculty perceptions of academic freedom at their institutions, the dependent variable, and the primary independent variable of targeted funding while controlling for other independent variables. In this model, the ordinary least squares principle was employed to obtain values for the regression coefficients. The purpose of applying ordinary least squares was to reduce error. This formula enabled the software program to choose coefficients that made the sum of the squared prediction errors as small as possible (Allison, 1999, p. 12). Using multiple regression analysis allowed the researcher to determine if one or more of the independent variables were predictive of faculty perception of academic freedom as measured on the inventory (Mitchell & Jolley, 2004; Huck & Cormier, 1996). Lewis-Beck suggests that the value of multiple regression is that it allows the researcher to avoid errors due to spuriousness, by holding independent variables constant (Lewis-Beck, 1980).

The *Pearson's R Correlation Coefficient* was calculated because it is recommended for use when conducting a correlation with interval data and is the most

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common calculation used for determining the relationship between variables in linear regression (Mitchell & Jolley, 2004, p. 161). Although the *Pearson's R Correlation Coefficient* was used to describe the nature of relationships, it was not used to measure cause and effect. Mitchell and Jolley (2004, p. 161) state that "the farther the coefficient falls from zero, the stronger the relationship." A negative score indicates an inverse relationship between the dependent and independent variables.

A *Coefficient of Determination (R^2)* also was calculated by squaring the *Pearson's R Correlation Coefficient* to determine the degree of any relationship. *The Coefficient of Determination* indicates the degree of variance amongst scores, and can tell the researcher how strong the relationship is. It measures the reduction in the amount of squared error over guessing the mean. "The *Coefficient of Determination* represents the degree to which knowing a participant's score on one variable helps you know the participant's score on the other variable" (Mitchell & Jolley, 2004, p. 162). McClave, Dietrich & Sincich (1997) state that the *Coefficient of Determination* determines how well the data fit the regression model. Using the *Student's t-test* for significance for each independent variable in a model alone can result in both types of error – rejecting relationships that are truly significant or accepting ones that are not (McClave, et al, 1997, p. 553). *Coefficients of Determination* are interpreted similarly to *Pearson's R Correlation Coefficients*. That is, a score close to 0 may indicate little relationship while scores close to 1 may indicate statistically significant results and therefore a relationship (Mitchell & Jolley, 2004, pp. 164-166); however, Mitchell and Jolley (2004, p.169) also point out that the larger the sample size, the more likely the standard error will decrease.

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In order to determine if the *Correlation of Determination (R^2)* truly reached the level of statistical significance and to adjust for this tendency to inflate the significance of any relationships, an *Adjusted $R^{2"}$* also was calculated for each regression. Mitchell and Jolley (2004, p. 533) recommend use of the *Adjusted $R^{2"}$* as it "adjusts" for the fact that the coefficient of determination (or R^2) may be an inflated estimate of the relationship. While a *Coefficient of Determination* can be used to determine if the equation predicts the relationship, an *Adjusted R^2* can indicate how well the equation predicts the relationship. The *Adjusted R2* is generally considered a better measure of fit in examining if the variance in the scores can be attributed to the predicted value. Without considering the *Adjusted R^2*, Mitchell & Jolley (2004, p. 533) suggest that the researcher can be misled into believing that the regression equation actually predicts a relationship when it really does not.

The *Standard Error of the Estimate* was also calculated as it is a measure dispersion of scores that incorporates all the residuals. It involves the differences between experimental and predicted y values for a given x. Predictions are considered better when the *Standard Error of the Estimate* is smaller (Brase & Brase, 1997). Best & Kahn (Chapter 10, 1993) note that when a *Correlation Coefficient R* is less than 1, error of prediction is inherent because there have been exceptions to the relationship. As the *Correlation Coefficient* increases, the prediction error decreases. They suggest that interpretation of the *Standard Error of the Estimate* is similar to the interpretation of the Standard Deviation. That is, the probability is that the predicted score would not be more

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than one *Standard Error of Estimate* from the actual score for 68 % of the predictions (Best & Kahn, Chapter 10, 1993).

Confidence tests at the 95% level also were conducted as part of each multiple regression analysis in order to test the null hypothesis, using degrees of freedom based upon the sample size and the number of independent variables (Lewis-Beck, 1980). An analysis of variance *(ANOVA)* of the mean scores was conducted for each research question to test for significance of relationships by applying the global *"F"* test to evaluate the quality of the overall model. (Mitchell & Jolley, 2004). An *F* ratio score was calculated by dividing the between-groups variance (effect plus random error) by the within-groups variance (random error). If a relationship is found beyond what one would expect with random error or chance, then the between-groups variance should be larger than the within-groups variance. The ratio of the between-groups variance to the within-groups variance is called the *F* ratio. An *F* ratio greater than 1 may indicate that the relationship was due to more than just chance or random error; no relationship would result in a ratio of 1. To determine if the *F* ratio was enough above 1 to indicate significance, the *F* score was then evaluated by the program using an *F* statistics table which referenced the degrees of freedom to determine if it was significant at the $p<0.05$ level (Mitchell & Jolley, 2004, pp. 309-313).

Another error that can be caused by multiple regression analysis is multicollinearity, which can cause a regression equation to underestimate the strength of a particular predictor variable. Collinearity can occur if two or more variables highly correlate with one another in a multiple regression, thus affecting the model. In order to

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control for multicollinearity, the researcher examined the *Pearson R* scores (Mitchell & Jolley, 2004) and a Variance Inflation Factor *(VIF)* was examined. A score higher than 5 indicates that error from multicollinearity is severe enough to reject the model (McClave et al., 1997).

McClave et al. (1997) recommend the use of stepwise regression to screen a model with a larger number of independent variables for those that have significant relationships. The stepwise regression tests every variable with all the variables already in the model and will screen out other variables for inclusion in the final model. Generally, only one set of variables are selected. Because of the high number of independent variables included in the model, the researcher conducted a stepwise regression analysis for each dependent variable following the initial multiple regression analysis of all independent variables. The stepwise regression analysis made a determination about which was the significant variable or variables in the prediction, if there was one. This test was used to screen out variables that were not found to be predictors (McClave et al., 1997).

In addition to evaluating the statistical significance of any relationships found, the researcher also examined the data and tests assessing error in the models. Regression residuals were calculated for each model, which address the effect of residuals on the predictions. The residual statistic estimates random error by dividing the observed value of y by the estimated (predicted) mean of the regression. Generally, residuals should fall within two Standard Deviations (*SD*s) of their mean of 0. Models that include ranges for

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residuals that fall outside three *SD*s of their mean are generally considered weak (McClave et al., 1997, pp. 573-578).

Results

Research Question 1

Research question 1 was: Is there a relationship between targeted funding, when controlling for other independent variables, and faculty perception of academic freedom? For research question 1, a multiple regression analysis was conducted to analyze the relationship of each dependent variable to targeted funding, while controlling for the other independent variables. The analysis excluded the generalist-specialist variable due to the low number of cases.

The researcher was unable to reject the null hypothesis for all the models due to the lack of statistical significance and low explanatory power. The multiple regression analysis for each dependent variable controlling for all independent variables produced modest *Correlation Coefficients* for each model (See Appendix H. Multiple Regression Analysis Tables with All Independent Variables and Appendix I. Correlations for All Independent Variables). Mitchell and Jolley (2004) have recommended that correlations of 0.2-.05 be considered small or modest when interpreting correlation coefficients.

A significant amount of error was present as indicated by the high *Standard Errors of the Estimate*. With Standard Deviations of 1, most of the models had *Standard Errors of the Estimate* greater than 0.95, indicating that almost the entire predictive relationships found for the models with all independent variables were attributed to

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random error, chance or other factors. The *Coefficients of Determination* or R^2 indicated that the predictor improved the estimate very little. The *Adjusted R2*, generally considered a better measure of fit than using R^2 alone, indicated that the variance in scores was attributed to error rather than the predictive relationship for all the models.

Institutional autonomy.

The multiple regression analysis for all independent variables and the dependent variable of institutional autonomy produced a small *Correlation Coefficient R* of 0.363, but the model was not found to be statistically significant with a *Global F* score of 1.381 and a *probability of F* of 0.202 ($p<0.05$). The R^2 of 0.132 indicated that the relationship improved the estimate relationship by only 13 % over guessing the mean. In addition, the A*djusted* R^2 of 0.036 indicated that only 3 % of the variance in scores could be attributed to the predicted value and the rest was attributed to error. With a Standard Deviation of 1, the *Standard Error of the Estimate* at 0.98 found that the almost the entire predictive relationship was due to random chance, error or other factors. The range for residuals was normal, falling outside two Standard Deviations from the mean (-2.56 and 2.53). The *VIF* for collinearity for most of the independent variables was under 2, except for tenure track, indicating little effects from error of collinearity

Only the independent variable for administrator was found to have a statistically significant *Student's t test* at 0.014 ($p<0.05$) and it had an *Unstandardized Coefficient of B* at 0.625. Given that the correlation for the factor analysis for the dependent variable institutional autonomy was negative, the *Unstandardized Coefficient* was interpreted as negative. With one *Standard Deviation* of 1, this indicated that being an administrator

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decreased the estimate by more than half a *Standard Deviation*. (Lower responses indicated a perception that academic freedom was inhibited.) Given the weak explanatory power of the model and the lack of statistical significance, the researcher did not reject the null hypothesis. Results for each analysis follow.

Faculty governance.

For faculty governance, the overall multiple regression model for all independent variables was not found to be statistically significant and had little explanatory power due to error and inability to attribute the variance in scores to the relationship. The overall model produced a modest correlation coefficient of 0.364; however, it was not found to be statistically significant. The regression analysis produced an *F score* of 1.469 and a *Global probability of F test* for significance at 0.163, which was greater than the $p<0.05$ level of significance set prior to the study. Given that the *Standard Deviation* was 1, the researcher attributed almost the entire predictive relationship to error, chance or other factors due to the high *Standard Error of the Estimate* of 0.97. In addition, the R^2 of 0.133 indicated that the relationship improved the estimate by only 13 % over guessing the mean. The researcher concluded from the *Adjusted* R^2, which is considered a better measure of fit than the R^2, that at 0.042, only 4% of the variance in the scores could be attributed to the predicted value.

The range for residuals was considered normal. The range for residuals fell slightly outside 2 *Standard Deviations* (-2.10 to 2.3). The *VIF* scores for the independent variables also were considered normal, ranging from 1.05 to 2.02. This indicated normal effects from collinearity. Finally, a review of the *Unstandardized Coefficients (B*) for

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each of the independent variables indicated that most had little effect on the prediction. Only the *B* for independent variable of administrator could be considered to produce a significant change at 0.611 with a statistical significance for the *Student's "t" test* of 0.013 ($p<0.05$). With a *Standard Deviation* of 1, being an administrator increased the estimate by more than half a *Standard Deviation*. All other independent variables were not found to be statistically significant. In conclusion, the researcher did not reject the null hypothesis given the overall model's lack of statistical significance, low explanatory power and the large amount of error.

Freedom to speak.

For the multiple regression analysis of targeted funding, while controlling for all other independent variables, with the dependent variable of freedom to speak, the model was not found significant with a *Global F ratio* score of 1.887 and a *Probability of F* test of significance at 0.059, which was only slightly higher than the $p<0.05$ level of significance set prior to the study (see Appendix H. Multiple Regression Analysis Tables with All Independent Variables Tables). The *Pearson's R Correlation Coefficient* was moderate at 0.441; however, the R^2 of 0.195 indicated that the predictor improved the estimate by only 19 % over guessing the mean. The *Adjusted* R^2 of 0.092 indicated that only 9 % of the variance in scores could be explained by the predictive relationship found in the regression analysis and the rest was attributed to random error, chance or other factors. The *Standard Error of the Estimate* of 0.95, with a *Standard Deviation* of 1, attributed almost all of the variance in scores to random error, chance or other factors. (See Appendix I. Correlations for all Independent Variables).

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A review of the results of individual correlations in the regression analysis did reveal a significant *Student's "t"* test result at the $p<0.05$ level of significance for gender with a *Student's "t"* test result of 0.008. The *Unstandardized Coefficient B* for gender was negative at -0.611. Given that the correlation for the factor analysis for the dependent variable of freedom to speak was positive, the finding was considered negative. With a *Standard Deviation* of 1, this finding indicated that being a female (value of 0) increased the estimate by more than half a Standard Deviation at -0.611, indicating that females considered freedom to speak to be inhibited.

The *VIF* was under 2 for all independent variables except for tenure, with a VIF score of 2.13; the researcher concluded that there was little effect from multicollinearity. A review of the range for residuals indicated they fell within a normal range, just slightly more than 2 Standard Deviations (range of -2.19 to 2.35, with a Standard Deviation of 89). Given the lack of statistically significant results, the error in the model and its low explanatory power, the researcher did not reject the null hypothesis for this model.

Freedom to research.

A multiple regression analysis was conducted to analyze the dependent variable of perception of freedom to research that included all independent variables. The model was not found to be statistically significant with a *Global F* test score of 1.192 with a *probability of F* test for significance of 0.309, which was greater than the $p<0.05$ level of significance set prior to the study. The *Correlation Coefficient R* was modest at 0.354. The R^2 of 0.126 found the prediction weak, indicating that the only 12 % of the relationship could be explained by the estimate over guessing the mean. The *Adjusted* R^2

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of 0.020 indicated that only 2 % of the variance in scores could be attributed to the relationship, and the rest was attributed to random error, chance or other factors. The *Standard Error of the Estimate* was 0.989. With a *Standard Deviation* of 1, this indicated that almost the entire predictive relationship was attributed to error, chance or other factors. In reviewing the results of the *Student's "t"* tests for the individual coefficients, none were found to be significant at the $p<0.05$ level of significance. The *VIF* for all independent variables was 1 for all the coefficients except for tenure track which was 2, indicating little error from multicollinearity. Based on the lack of any statistically significant results and the overall weakness of the model, the researcher did not reject the null hypothesis.

Freedom to teach.

The multiple regression analysis for the dependent variable of freedom to teach with all independent variables was not found significant for the model, with a *Global F* score of 1.872 and a *Probability of F* test for significance of 0.061, which was slightly higher than the level of significance set prior to the study at ($p<0.05$). The *Correlation Coefficient R* was modest at 0.429 for the relationship. The R^2 was 0.184, indicating that the model improved the estimate by 18 % over guessing the mean. In addition, the *Adjusted* R^2 0.086 indicated that only 8% of the variance in scores could be attributed to the estimate and the rest to error, chance or other factors. With a *Standard Deviation* of 1, the *Standard Error of the Estimate* of 0.95 indicated that almost the entire predictive relationship was attributable to error. The range for the residuals was normal, falling at 2 *Standard Deviations* (range from -1.89 to 2.03).

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A review of the *Student's t* tests for significance of the coefficients indicated statistical significance for the independent variables of rank with a *Student's "t" test* of significance at 0.023 and for gender at 0.033 at the $p<0.05$ level of significance. The *Unstandardized Coefficients* for rank was 0.676 and a negative of -0.467 was found for gender. Given a positive correlation for the factor analysis for the dependent variable of freedom to teach, the coefficient of rank was considered negative and the coefficient of gender was considered positive. Scores that were high on the inventory for perception of freedom to teach indicated a perception that this academic freedom was healthy. The teaching category had been scored differently. This indicated that having a higher rank of professor or associate professor increased the estimate by more than half a *Standard Deviation*, thus indicating a perception that academic freedom was healthier at his or her institution than for faculty of lower ranks. For gender, which was negative, being male decreased the estimate by more than half a *Standard Deviation*, indicating a perception that academic freedom was more inhibited than it was for women; however, the overall model was not found to have a statistically significant *probability of F*. In addition, the model had weak explanatory power; therefore, the researcher could not reject the null hypothesis.

Research Questions 2- 4

After conducting a multiple regression analysis for each dependent variable that included all the independent variables, a stepwise regression analysis was then conducted for each dependent variable to develop a more parsimonious model for research questions 2-4. (See Appendixes J. Stepwise Regression Output Tables and K. Stepwise Regression

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Correlations). Each stepwise regression model produced at least one statistically significant predictor. The *Unstandardized Coefficient B* for each stepwise regression model indicated a change in the estimate of half, or nearly half, a *Standard Deviation.* The results are described below. Overall, the models were found to have weak explanatory power, and thus the researcher was cautious in drawing any conclusions from these results.

A significant amount of error was present as indicated by the high *Standard Errors of the Estimate*. With *Standard Deviations* of 1 and *Standard Errors of the Estimate* greater than 0.95, almost the entire predictive relationships found were attributed to random error, chance or other factors. Other measures such as the *Coefficient of Determination* or R^2 indicated that the predictor improved the estimate very little. The *Adjusted R2* indicated that the variance in scores was attributed to error rather than the predictive relationship for all the models. Results for each stepwise regression model follow.

Institutional Autonomy.

A stepwise regression analysis was conducted in order to produce a parsimonious model (See Appendix J. Stepwise Regression Output Tables and K. Stepwise Regression Correlations). Using this technique, the researcher relied upon the program to select a statistically significant predictor or predictors if there were any. The model selected the independent variable of administrator as the only significant predictor for institutional autonomy, which had a small *Correlation Coefficient* of 0.244. The model was found statistically significant with a *Global F test* score of 6.343 and with a *Probability of F* at

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0.013, which was higher than the level of significance set prior to the study at $p<0.05$. The R^2 was 0.060, indicating that the relationship improved the estimate by only 6 % over guessing the mean. The *Adjusted* R^2 of 0.050 indicated that only 5% of the variance in scores could be attributed to the predicted value. The *Standard Error of the Estimate* was 0.98. With a *Standard Deviation* of 1, this indicated that almost the entire relationship was due to error, chance or other factors not measured. The *VIF* was 1 for all the coefficients, indicating error from multicollinearity was not large enough to reject the model.

The *Unstandardized Coefficient B* was positive at 0.565, but the difference was considered negative given the negative correlation for the dependent variable of institutional autonomy from the factor analysis. Given that the *Standard Deviation* was 1, being an administrator decreased the estimate by more than half a *Standard Deviation*, indicating a perception that institutional autonomy was healthy at his or her institution. Higher scores for institutional autonomy indicate a greater perception that academic freedom is inhibited at his or her institution. Despite the model being found statistically significant and the findings for the *Unstandardized Coefficient B*, the results have to be interpreted cautiously due to the poor explanatory power of the model as the correlation found could not account for the variance in scores.

Faculty governance.

A stepwise regression analysis was undertaken to produce a more parsimonious model (See Appendix J. Stepwise Regression Output Tables and Appendix K. Stepwise Regression Correlations). The program selected administrator as the only significant

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predictor for perception of faculty governance at the respondents' institutions, which produced a *Global F ratio* score of 8.326 that was found statistically significant with a *probability of F* at 0.005 ($p<0.05$). The *Correlation Coefficient* was considered small at 0.271. With a *Standard Deviation* of 1, the results of the R^2 of 0.073, which indicated the relationship improved the estimate by only 7% over guessing the mean. Similarly, the *Adjusted* R^2 of 0.065 indicated that only 6 % of the variance in scores could be attributed to the predictive value. With a *Standard Deviation* of 1, the *Standard Error of the Estimate* at 0.967 indicated that the relationship was almost entirely attributed to error, chance or other factors.

The negative *Unstandardized Coefficient B* of -0.629 indicated that being an administrator decreased the estimate by more than half a *Standard Deviation* at -0.629. Given that high scores represent a perception that faculty governance may be inhibited, these findings indicate that being an administrator may be predictive of a perception that faculty governance is healthy while being a faculty member may be predictive that faculty governance is inhibited. Despite these findings and the statistical significance found for the overall model, the model was found to have little explanatory power; any predictive relationships found were attributed to error, chance or other factors. Thus, these findings were interpreted cautiously.

Freedom to speak.

A stepwise regression analysis was conducted in order that the program could select a significant predictor for the dependent variable of freedom to speak, if there was one. The program selected gender and race as statistically significant predictors for the

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model with a *Global F* test score of 3.97 and a *Probability of F* test of significance at 0.049 ($p<0.05$). The *Correlation Coefficient R* was small at 0.309. The R^2 of 0.096 indicated that the relationship improved the estimate only by 9 % over guessing the mean. The model reported an *Adjusted R2* of 0.074, indicating that the predictive relationship explained only 7 % of the variance in scores and the rest was attributed to error, random or other factors. The *Standard Error of the Estimate* was 0.96. With a *Standard Deviation* of 1, this indicated that at 0.96 almost the entire relationship was attributed to error, chance or other factors.

The range for residuals was found normal at approximately 2 *Standard Deviations*. The *Standardized Coefficient R* for gender was negative at -0.235 and for race was negative at -0.204. The *Unstandardized Coefficient B* for gender was -0.478 and for race was -0.479. This indicated that, with a *Standard Deviation* of 1, being female increased the estimate by almost half a *Standard Deviation* for a perception that academic freedom was inhibited, while being male decreased the estimate by almost half a *Standard Deviation*, indicating that male faculty perceived freedom to speak to be healthier. Similarly, with a *B* of -0.479, being a minority increased the estimate by almost half a *Standard Deviation*, which indicated a greater perception that academic freedom of speech was inhibited at their institution. Conversely, not being a medical minority decreased the estimated by almost half a Standard Deviation, which meant a perception that academic freedom of speech was healthier. For the findings in this study, women and racial minorities considered freedom to speak to be inhibited at their institutions. While the model was found statistically significant overall with the *Global probability of F* at

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0.049 ($p<0.05$), it was still found to be weak due to its low explanatory power, as the relationships did not account for the variance in scores, and the large *Standard Error of the Estimate,* which attributed most of the relationship found to error, chance or other factors. These findings were interpreted cautiously due to the weak explanatory power of the model.

Freedom to research.

A stepwise regression analysis was conducted of the dependent variable of freedom to conduct research in order to identify a statistically significant predictor for the dependent variable, if there was one. The model chose the independent variable of tenure track and it was found statistically significant with a *Global F* score of 3.993 with a *probability of F* test of significance at 0.049 ($p<0.05$). The *Correlation Coefficient R* was considered small at 0.204. The R^2 was 0.042, indicating that the relationship improved the estimate by only 4%**.** The *Adjusted* R^2, which is [a] better measure of fit, was 0.031, indicating that only 3% of the variance in the scores could be attributed to the predicted value. The *Standard Error of the Estimate* was 0.98. With a *Standard Deviation* of 1, almost the entire relationship was attributed to error, chance or other factors. Review of the residuals found the range to be normal, falling slightly outside of 2 Standard Deviations (range from -2.11 to 2.32).

The factor analysis of the dependent variable of perception of freedom to research at their respective institutions produced a negative correlation. With a *Standard Deviation* of 1, the *Unstandardized Coefficient B* of 0.432 indicated that being on the tenure track increased the estimate almost half a Standard Deviation. Since the factor

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analysis was negative and given a *Standard Deviation* of 1, being on the tenure track decreased the estimate by slightly less than half a *Standard Deviation*, and being on the collateral track increased the estimate. Given that lower scores meant a perception that freedom to research at their institutions was healthier, then being on the collateral track indicated the opposite, that is, a faculty perception of freedom to research at their institutions was inhibited.

Although the model was found statistically significant and the *B* score indicated that half a change in the predictor variable tenure track produced a difference in perception of freedom to research, the findings must be interpreted cautiously. The overall model was generally weak, given its low explanatory power. The findings indicated that that the variance in scores is most likely due to error, chance or other factors.

Freedom to teach.

The researcher then conducted a stepwise regression analysis, which selected gender and citizenship was having the most statistically significant predictive relationship for freedom to teach. The *Correlation Coefficient R* for the model was small at 0.313 for the model. The *Global F* score was 4.245 and the *Probability of F* test for significance was 0.42, which was found statistically significant at the $p<0.05$ level set prior to the study. The R^2 of 0.098 indicated that the relationship improved the estimate by only 9 % over guessing the mean. The *Adjusted* R^2 was 0.078, indicating that only 7% of the variance in scores could be attributed to the predicted value. The *Standard Error of the*

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Estimate was 0.96. With a *Standard Deviation of 1*, this indicated that the predictive relationship was almost entirely attributed to random error, chance or other factors.

The *Unstandardized Coefficient B* was negative for both gender and citizenship, and the correlation for the factor analysis of freedom to teach was positive; thus, the *Unstandardized Coefficients* were considered negative. Unlike the other dependent variables, higher scores on the inventory for freedom to teach indicated that this academic freedom was perceived to be healthier while lower scores indicated that this academic freedom was considered inhibited by the respondent at his or institution. With a *Standard Deviation* of 1, the *B* for gender at -0.519 indicates that being male (with a value of 1) would decrease the estimate by half a *Standard Deviation*, which would be a perception that academic freedom was inhibited at their institutions. The *B* for citizenship at -0.637 indicated that not being a citizen increased the estimate by more than half a *Standard Deviation*. Thus, not being a citizen indicated a faculty perception that freedom to teach at his or her institution was healthier while having citizenship indicated a perception that academic freedom to teach was inhibited.

While the overall model was found to be statistically significant and the *Unstandardized Coefficient B* found half a *Standard Deviation* in change for the predictor variables, the model is still considered weak due to its low explanatory power. The researcher interpreted these findings cautiously.

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Discussion of Results

Results from this study found statistically significant results for the stepwise regression analysis for research questions 2-4, but not research question 1. Still, the models were weak in that the relationships could not explain the variance and the relationships improved the estimate by very small percentages in all models. Thus, results indicated that the relationships were attributed to random chance, error or other factors not included for analysis. In addition, the results need to be interpreted cautiously because a representative sample was not collected, and the dependent variables of freedom to speak, research and teach fell below the recommend 100 sample cases for analysis. The researcher could not reject the null hypothesis for Research Question 1, which tested for a relationship between targeted funding, when controlling for other variables, and the dependent variables. Findings were interpreted cautiously for research questions 2-4 due to their weak explanatory power.

In interpreting the results, the findings from stepwise regression analysis for the dependent variables of faculty governance and institutional autonomy support the general higher education and academic medicine literature. There is more written about faculty governance in other disciplines in academia than in academic medicine, yet respondents in this study indicated they thought it was inhibited. In the academic medical literature, the professorate raised more concern about the effects of the business process model of management in medical education. This management model is more hierarchical than collaborative, while faculty governance is based upon joint decision making. There is some indication from the literature that the influence of hospital market interests, which

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use a corporate management method, along with an overall institutional drive to generate clinical revenues may hinder collegial decision making (AAUP, 2001; AAUP, 2006).

For institutional autonomy, the academic medical literature has expressed concern over the effect that academic-industry relationships may have overall on the culture of institutions, and particularly in how decisions are made and the research agenda at their institutions. These findings indicate that administrators consider institutional autonomy to be healthy at their institutions but not their. These findings may indicate that a gap exists between how leadership and faculty perceive the status of their institution's autonomy, which would provide support for recommendations from Goodell (2005), who suggested better communication is needed in higher education between leadership and faculty (O'Neill, 1997; Scott, 1996; Jones, et al, 2005).

For freedom to speak, the results of analysis found a relationship between being a minority and a female, separately, with a perception that faculty rights to speak freely at their institutions were inhibited. Conversely, being male and white, separately, were found to have a relationship to the perception that freedom to speak was healthier at their institutions. These findings support the literature, where studies have indicated the women and minorities are underrepresented and concerns have been expressed about this issue by the professorate (AAMC, 2007, Sept. 25; AAMC, 2008, *An AAMC campaign to increase diversity in medicine*; Magrane & Lane, 2006; Bickel et al., 1996).

Holding a collateral track position also was found to have a predictive relationship with a perception that freedom to research at their institutions was inhibited. This finding may provide some support for the rationale for tenure as stipulated in the *AAUP*

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Statement of Principles on Academic Freedom and Tenure. Tenure is thought necessary to provide economic protection for faculty against undue interference and unfair dismissals for, among other academic freedoms, conducting unconventional research (AAUP, 2006, *1940 Statement of Principles on Academic Freedom and Tenure with 1970 Interpretive Comments*). These findings may indicate that whether or not the faculty member has attained tenure, the tenure track still provides greater protection for academic freedom of research than the collateral track does. The researcher speculated that tenure track faculty may have perceived that their peers have a greater freedom to choose research topics of their choice than their collateral track counterparts, who may have been hired to support a specific research project not of their choosing and perceive that this freedom is then inhibited at his or her institution.

The findings for freedom to speak do not appear to have support from the literature. Gender and citizenship were each found to have a small but statistically significant negative correlation with the dependent variable of perception of freedom to teach, with females perceiving more freedom to teach than males and non-U.S. citizens perceiving greater freedom to teach than citizens. Without gathering more qualitative information about the unique experiences between men and women and why they may hold different perceptions, it is difficult to interpret these results. One possibility is that men may be more aware of, or more concerned about, issues affecting curriculum in medical education and teaching than women. Some of these discussed in the literature include accountability for results in education (Cook, 1997), targeted funding for curricular changes (Willett et al., 2003; Brainard, 2006; Brainard, 2007), Medicare

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funding of specific residency programs which impacts the numbers of residency positions for particular specialties (Mangan, 2006), and pharmaceutical support for resident and physician training (Packer, 2005).

The findings for citizenship were not as the researcher expected and also were not supported in the literature. The professorate have raised concerns about the treatment of foreign faculty due to government interference in the name of national security interests following 9-11 (Kless, 1990; AAUP, 2003, *Academic Freedom and National Security in a Time of Crisis. Report of the AAUP Special Committee on Academic Freedom and National Security in a Time of Crisis*). One interpretation is that foreign faculty may come from countries that limit freedom to speech and thus, in comparison, perceive greater freedom in teaching in American medical schools. While most of these findings support concerns that have been raised in the literature, the results need to be interpreted cautiously given the low explanatory power of the models and the lack of a representative sample.

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Chapter V. Conclusions

Any conclusions that are drawn from the results of this study are limited by the lack of a representative sample and the low explanatory power for the models. Because the inventory was developed solely for the purpose of this study and did not undergo reliability testing and additional pilot studies, the construct of academic freedom may not have been measured accurately. Similarly, the question on the survey asking if the respondent received support from a research grant may not be an accurate measure of targeted funding.

The researcher was able to collect more than 100 cases for only two of the dependent variables – institutional autonomy and faculty governance. Freedoms to research, speak freely and teach included less than 100. A representative sample was not collected, which further weakens any conclusions that can be drawn about the results. Because the major categories of academic freedom – faculty governance, institutional autonomy and the freedoms to conduct research, speak and teach—were included in the survey along with all issues identified in the literature, the survey became lengthy. This may have discouraged busy faculty members in academic medicine at the end of the summer and early fall semesters. The lower responses for freedoms to research, speak and teach may be due to missing scores, where faculty members tired of taking the entire survey.

The results of this study found no statistically significant results for research question 1, which examined if there was a relationship between targeted funding and faculty perception of academic freedom at their institutions when controlling for other

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variables. For research questions 2-4, independent variables other than targeted funding were found to produce small to modest correlation coefficients that were statistically significant, but all the models had low explanatory power. Additional studies need to be undertaken to test the reliability of the inventory and to determine if these findings can be replicated with a representative sample.

Statistically significant results were produced when the researcher conducted a stepwise multiple regression analysis. Even with these results, the correlation coefficients could be considered modest at best and additional measures indicated that the relationships found could not be attributed to the predictor, but instead were attributed to error, chance or other factors. The models were found to have low explanatory power.

In this study, a statistically significant relationship was found for faculty governance and administrators, who perceived faculty governance to be healthier than their faculty (who did not hold administrative posts) at their institutions These findings provide some support for concerns expressed in the general higher education literature regarding the health of faculty governance, which has reported cases of faculty being bypassed in favor of more hierarchical forms of decision making by leadership (Scott, 1996; AAUP, 1999, Conference on Academic Values in the Transformation of Academic Medicine Report). While the general higher education literature appears to contain more articles expressing concern about this academic freedom than the academic medicine literature, the physician and basic sciences faculty included in this study perceived governance to be inhibited nonetheless (Ramo, 1997; Robyn & Fries, 2002; Bartlett & Rooney, 2003).

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Similarly, there were statistically significant results in regards to faculty and institutional autonomy. Faculty who did not hold administrative posts were found to perceive institutional autonomy to be inhibited. The researcher interpreted these findings as supportive of concerns raised in the literature indicating that academic medicine may be vulnerable to the same issues that other disciplines have in higher education regarding the business process model and industry-academic medicine relationships (Goodell, 2005; AAUP, 1999, Conference on Academic Values in the Transformation of Academic Medicine Report). Like faculty governance, institutional autonomy appears to receive more attention in the general higher education literature than in academic medicine, yet medical school faculty in this study indicated a lower perception of academic freedom in relation to the autonomy of their institutions in comparison to their administrators. Wolfendon (1970) has suggested that institutions that accept funds for specific projects, whether state or corporate, must assume that those funds come with strings attached. At the same time, administrators, who have greater responsibility for institutional autonomy and protecting their institutions from undue interference, may have a greater understanding of the health of institutional autonomy of their schools than faculty.

The findings related to gender and race in perception of freedom to speak provide support for articles in the medical education literature expressing concern about the underrepresentation of minorities in medicine (AAMC, 2008, *An AAMC campaign to increase diversity in medicine*), and specifically for women, their underrepresentation in tenure track positions and positions of leadership in academic medicine (Bickel et al., 1996; Magrane & Lane, 2006).

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Other findings from this study have not been found by this researcher in the literature, such as the relationships found for gender and citizenship in relation to perception of freedom to teach. Contrary to expectations from the researcher, the findings indicated that men perceived freedom to teach to be inhibited at their institutions while women perceived it to be healthier. Based upon the review of the literature, the researcher would have expected women to have a perception that freedom of teaching was inhibited at their institutions. The researcher has speculated that men may have more knowledge of intrusions into this academic freedom by virtue of their longer tenure in academic medicine and their larger numbers in tenure track positions and positions of leadership. In addition, the composition of medical schools and faculty has become more balanced between men and women, where women are no longer a minority in medicine in terms of faculty representation (Bickel et al., 1996). It may be that the change in the composition of the faculty in relation to gender within the last decade has somehow affected male faculty perception of freedom of teaching at their institutions.

In addition, contrary to the researcher's expectations, faculty without U.S. citizenship perceived freedom to teach at their institutions to be healthy while U.S. citizens considered it to be inhibited. The researcher has speculated that foreign faculty may come from countries with greater restrictions on the teacher-student relationship and freedom in the classroom; thus, in comparison, American academic institutions may provide greater freedom to teach than other countries. Review of the literature did not find writings that would have predicted this finding. On the contrary, the literature has indicated that national security interests after 9-11 may have imposed greater restrictions

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on non-U.S. citizens; thus, the researcher would have expected non-U.S. faculty members to perceive academic freedom to teach to be inhibited at their institutions (Monastersky, 2007; Monastersky, 2008).

Finally, the results related to perception of freedom to research and tenure track positions support concerns raised in the literature about the growing number of collateral or part-time faculty and the effect this trend may have on academic freedom (Liu & Mallon, 2004). In addition, much has been written about the deleterious effect of targeted funding on the research agenda in academic freedom (Angell, 2000). In this study, tenure track faculty had a greater perception that rights to research at their institutions were healthier than their collateral track colleagues. The researcher interpreted this as providing some support that tenure, even if not yet granted, may afford greater freedom for tenure track faculty (AAUP, 2006, *1940 Statement of Principles on Academic Freedom and Tenure with 1970 Interpretive Comments).* The researcher also interpreted this finding as supportive of concerns raised in the literature about the increase in collateral track faculty, who may be devoted to a specific research project and thus limited in pursuing research projects of their choice (Bradley, 2004).

Recommendations

The weak explanatory power of the models and lack of a representative sample severely limit any conclusions that can be drawn from the findings. To address these limitations, the researcher recommends additional quantitative studies with a representative sample, reliability testing of the inventory and more accurate measurement

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of the independent variable of targeted funding. Repeating this study with a more representative sample from more medical schools may increase the ability of the predictors to explain any findings and reduce error.

The financing of medical education is particularly complex, drawing upon multiple sources of revenue that are sometimes difficult to accurately identify or categorize by source or allocation. Identifying a targeted funding amount involves the collection of multiple revenue sources, including corporate, alumni, individual gifts, and government funding. The researcher discovered that it is difficult and time consuming for institutions to collect and categorize such information. That targeted funding in this research was not found to have a relationship with the dependent variable of academic freedom may have been the result of inaccurate measurement of this variable.

The survey was designed to assess faculty perception of academic freedom by using questions that addressed issues and trends discussed in the literature that were thought to inhibit academic freedom. Further study of issues that faculty perceive to threaten their academic freedom is warranted. The current study relied upon editorials and other types of expert opinion in the literature, which may or may not represent the viewpoints of academic medicine faculty. Additional faculty interviews or focus group discussions might produce more relevant questions. In addition, reversing the academic freedom index so that the dependent variable was the issue, i.e., national security interests (national security interests inhibit freedom to research, national security interests inhibit freedom to speech, etc.) might produce different results. That is, instead of using academic freedom as the dependent variable, using the issues identified from the

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literature as the dependent variables might produce different results, although the models would still be weak due to their low explanatory power.

Academic freedom is a complex issue that may need further study using a variety of research methods, including qualitative studies. One benefit of using an on-line survey is time. Interviews and focus group studies take valuable time for busy academic medicine faculty members, and focus group discussions have challenges in terms of confidentiality, whereas surveys afford confidentiality and take less time. However, qualitative study may help illuminate some of the findings from this study, particularly those less mentioned in the literature such as why men may perceive freedom to teach to be inhibited more than women.

Additional research to develop an instrument that accurately measures the construct of academic freedom in medical education is recommended. The instrument itself was a limitation to the study as it did not undergo standard tests for reliability. A review of the research undertaken in preparation for this study did not find an inventory or survey that comprehensively addressed academic freedom or the issues currently identified problematic in the literature. Additional qualitative study similar to that undertaken by Goodell in his 2005 interview study of how faculty define academic freedom may help in constructing an accurate instrument. Issues that were given significant treatment in the general higher education literature did not seem to be given the same level of treatment in the academic medical literature, yet these findings provide some support for faculty concern about the health of self-governance, for example, and institutional autonomy. Faculty input would be useful information in the development of

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an inventory that addressed their concerns rather than relying solely upon expert opinion from the literature.

The independent variables found to have a statistically significant relationship with the dependent variables included gender, citizenship, race, administrator, and tenure track. Further study on how these characteristics relate to academic freedom is justified, including quantitative study to examine if the differences found in this study can be replicated with a representative sample. Additional qualitative study, in particular, is justified to examine why these differences were found (if they exist) in perception between men and women, tenure and collateral track faculty, citizens and non-U.S. citizens, between minorities and whites, and between faculty and administrators in academic medicine.

The gap between administrators and faculty in their perceptions about freedom to research may indicate a need for leadership to communicate to faculty about issues affecting institutional autonomy. Goodell (2005), in his qualitative study of and academic freedom, made recommendations that faculty needed to educate the public about how academic freedom benefits society. Similarly, the small relationship found between the perceptions of administrators and their faculty related to the health of institutional autonomy and faculty governance may indicate a need for leadership to communicate internally to their faculty about the status of institutional autonomy and to include faculty in institutional decision making.

There may be other variables that relate to academic freedom as much as, or more than, those included in this study. In particular, the findings indicating a relationship

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between male faculty who perceived academic freedom to teach as inhibited warrants further study and explanation. This researcher did not find this phenomenon mentioned as a concern in her review of the academic medical literature, and may be due to error in the study from lack of a representative sample size. Regardless, additional quantitative study that included more questions about freedom to teach in relation to gender differences is warranted. Given other research indicating that women are underrepresented in positions of leadership, it may be that while men have more general administrative responsibilities, women have more curricular responsibilities, or vice versa (Bickel et al., 1996).

In conclusion, academic freedom is a complex issue that warrants further study using both qualitative and quantitative methodologies. Other independent variables not measured in this study may have a greater relationship to academic freedom than those examined in this study. In addition, this study had significant limitations from lack of reliability testing of the instrument and the small sample size. The independent variable of targeted funding and the dependent variable of academic freedom may not have been measured precisely by the instrument. There may be other issues related to academic freedom that medical faculty find more important than the ones measured by this academic freedom inventory.

While conclusions cannot be generalized about the findings, most of the results were consistent with the issues discussed in the literature as most troublesome to the professorate in terms of the health of their academic freedoms. Further study, however, is warranted. Given that most of the literature related to this topic in academic medicine

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is either editorial in nature or studies that relate to one or two specific issues such as conflicts of interest, additional study of faculty perception of academic freedom in medical education is justified.

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Appendix A. U.S. Medical Schools in Mid-Atlantic Region

District of Columbia

George Washington University
School of Medicine and Health Sciences
Office of Admissions
2300 I Street, NW
Ross Hall 716
Washington, DC 20037
E-mail: medadmit@gwu.edu
(202) 994-3506
AMCAS // Deadline Information // Private

Georgetown University
School of Medicine
Office of Admissions
3900 Reservoir Road, NW
Washington, DC 20007
(202) 687-1154
AMCAS // Deadline Information // Private

Howard University
College of Medicine
Admissions Office
520 W Street, NW
Washington, DC 20059
(202) 806-6270
AMCAS // Deadline Information // Private

Kentucky

University of Kentucky
College of Medicine
Admissions, Room MN-102, Office of Education
Chandler Medical Center
800 Rose Street
Lexington, KY 40536-0298
(606) 323-6161
AMCAS // Deadline Information // Public

www.manaraa.com

University of Louisville
School of Medicine
Office of Admissions
Abell Administration Center
323 East Chestnut
Louisville, KY 40202-3866
(502) 852-5193
AMCAS // Deadline Information // Public

Maryland

Johns Hopkins University
School of Medicine
Committee on Admission
733 N. Broadway, Suite G49
Baltimore, MD 21205
(410) 955-3182 //AMCAS// Deadline Information // Private

University of Maryland
School of Medicine
Health Sciences Facility I
685 W. Baltimore Street
Suite 190
Baltimore, MD 21201
(410) 706-7478
AMCAS // Deadline Information // Public

Uniformed Services University of the Health Sciences
F. Edward Hebert School of Medicine
Admissions Office, Room A-1041
4301 Jones Bridge Road
Bethesda, MD 20814-4799
(800) 772-1743
AMCAS // Deadline Information // Federally-chartered

North Carolina

Wake Forest University School of Medicine
Office of Medical School Admissions
Medical Center Blvd.
Winston-Salem, NC 27157-1090
(336) 716-4264
AMCAS // Deadline Information // Private

www.manaraa.com

Duke University
School of Medicine
Committee on Admissions
P.O. Box 3710
Durham, NC 27710
(919) 684-2985
AMCAS // Deadline Information // Private

The Brody School of Medicine at East Carolina University
Office of Admissions
2 North 49
Greenville, NC 27858-4354
(252) 744-2202
AMCAS // Deadline Information // Public

University of North Carolina at Chapel Hill
School of Medicine
Office of Admissions
121 MacNider Hall, CB #9500
Chapel Hill, NC 27599-9500
E-mail: admissions@med.unc.edu
(919) 962-8331
AMCAS // Deadline: November 15//Public

Ohio

Case Western Reserve University
School of Medicine
Associate Dean for Admissions and Student Affairs
10900 Euclid Avenue
Cleveland, OH 44106-4920
(216) 368-3450
AMCAS // Deadline Information // Private

University of Cincinnati
College of Medicine
Office of Student Affairs/Admissions
P.O. Box 670552
Cincinnati, OH 45267-0552
(513) 558-7314
AMCAS // Deadline Information // Public

www.manaraa.com

University of Toledo College of Medicine
Admissions Office
3045 Arlington Ave
Toledo, OH 43614
(419) 383-4229
AMCAS // Deadline Information // Public

Northeastern Ohio Universities
College of Medicine
Office of Admissions and Institutional Research
P.O. Box 95
Rootstown, OH 44272-0095
E-mail: admission@neoucom.edu
(330) 325-6270
AMCAS // Deadline Information // Public

Ohio State University
The Ohio State University College of Medicine & Public Health
Admissions Committee
209 Meiling Hall
370 West Ninth Avenue
Columbus, OH 43210-1238
E-mail: medicine@osu.edu
(614) 292-7137
AMCAS // Deadline Information // Public

Wright State University
Boonshoft School of Medicine
Office of Student Affairs/Admissions
P.O. Box 1751
Dayton, OH 45401
E-mail: som_saa@.wright.edu
(937) 775-2934
AMCAS // Deadline Information // Public

Tennessee

East Tennessee State University
James H. Quillen College of Medicine
Assistant Dean for Admissions and Records
P.O. Box 70580
Johnson City, TN 37614-1708
E-mail:sacom@etsu.edu

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(423) 439-2033
AMCAS // Deadline Information // Public

Meharry Medical College
School of Medicine
Director, Admissions and Records
1005 D. B. Todd Boulevard
Nashville, TN 37208
(615) 327-6223
AMCAS // Deadline Information // Private

University of Tennessee, Memphis
College of Medicine
790 Madison Avenue
Memphis, TN 38163-2166
(901) 448-5559
AMCAS // Deadline Information // Public

Vanderbilt
School of Medicine
Office of Admissions
215 Light Hall
Nashville, TN 37232-0685
(615) 322-2145
AMCAS // Deadline Information // Private

Virginia

Eastern Virginia Medical School
Office of Admissions
700 W. Olney Road
Norfolk, VA 23507-1607
(757) 446-5812
AMCAS // Deadline Information // Private

VCU/MCV
School of Medicine
Medical School Admissions
P.O. Box 980565
Richmond, VA 23298-0565
(804) 828-9629
AMCAS // Deadline Information // Public

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University of Virginia
School of Medicine
Medical School Admissions Office
PO Box 800725
Charlottesville, VA 22908
(804) 924-5571
AMCAS // Deadline Information // Public

West Virginia

Marshall University
School of Medicine
Admissions Office
1600 Medical Ctr Dr, Ste 3400
Huntington, WV 25701
(304) 691-1738
AMCAS // Deadline Information // Public

West Virginia University
School of Medicine
Office of Admissions and Records
Health Sciences Center
P.O. Box 9815
Morgantown, WV 26506
E-mail: medadmissions@hsc.wvu.edu
(304) 293-3521
AMCAS // Deadline Information // Public

AAMC, U.S. and Canadian medical schools (2008). Available at http://www.aamc.org/students/applying/admissions.htm

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Appendix B. Rank Order of Medical Schools for NIH Grant Awards

Rank Order of Medical Schools According to NIH grant award dollars for fiscal years 2005-06 and 2006-07

Fiscal Year 2005-06

			Rank order
East Tenn	$2,380,752	TN	1
Northeastern	$2,495,784	OH	2
EVMS	$3,876,070	VA	3
ECU	$4,776,700	NC	4
Marshall	$5,098,993	WV	5
Wright State	$10,821,659	OH	6
U Toledo	$13,570,900	OH	7
George Washington	$15,780,152	DC	8
WVU	$15,940,538	WV	9
Howard	$18,942,002	DC	10
Meharry	$25,175,940	TN	11
Univ Louisville	$41,706,624	KY	12
U Tenn	$42,276,845	TN	13
VCU	$56,441,174	VA	14
Georgetown	$63,192,546	DC	15
UK	$65,607,746	KY	16
Ohio State	$83,796,983	OH	17
U Cinn	$90,840,803	OH	18
Wake	$111,460,343	NC	19
UVA	$134,136,920	VA	20
U of MD	$148,670,723	MD	21
UNC	$213,226,873	NC	22
CWRU	$243,263,767	OH	23
Vanderbilt	$250,402,245	TN	24
Duke	$388,462,784	NC	25
Johns Hopkins	$448,419,783	MD	26

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Fiscal Year 2006-07

Northeastern	$2,232,624	OH	1
E Tenn	$2,496,740	TN	2
EVMS	$3,511,446	VA	3
ECU	$5,592,209	NC	4
Marshall	$5,826,541	WV	5
Wright	$8,934,148	OH	6
Toledo	$10,746,241	OH	7
Howard	$14,843,837	DC	8
WVU	$16,418,875	WV	9
GW	$17,991,628	DC	10
Meharry	$22,401,704	TN	11
U Tenn	$37,160,441	TN	12
U Louisville	$40,204,130	KY	13
VCU	$56,447,550	VA	14
Georgetown	$58,154,755	DC	15
UK	$62,707,407	KY	16
Ohio State	$78,045,264	OH	17
U Cinn	$88,156,120	OH	18
Wake Forest	$97,733,305	NC	19
U MD	$129,282,327	MD	20
UVA	$140,533,551	VA	21
UNC	$208,648,725	NC	22
CWRU	$225,840,559	OH	23
Vanderbilt	$282,284,346	TN	24
Duke	$343,872,781	NC	25
Johns Hopkins	$434,696,775	MD	26

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Appendix C. Academic Freedom Inventory

1) Please select the one academic title that most closely describes your faculty classification:

Professor: ___ Associate Professor: ___ Assistant Professor: ___
Instructor:___ Other:_____

2) Do you have tenure? Yes:____ No:____

3) Please select only one of the following:
Tenure Track:_____ Non-tenure Track:_____ Retired:_____

4) Are you a physician? Yes:____ No:____ (If no, skip to #7).

6) If you are a physician, what is your medical specialty? (Please mark only one.)

Generalist:_____ Specialist:_____ Combined Generalist/Specialist:____

7) If you hold an administrative position, please select the one administrative title that most closely describes your responsibilities.

President or Vice President:____Dean:____Assistant Dean:____Department Chair:____
Division Chair: _____Section Chief:____ Other (please describe):_____

8) Gender M:_____ F:_____

9) Please choose one.
Race: Asian:____ American Indian and Alaska Native:____ White:____
Hispanic or Latino:_____ Black or African American:_____ Cuban:____
Native Hawaiian and Other Pacific Islander: ____ Puerto Rican:___
Other Non-Hispanic or Latino Race:_____ Mexican American:____
Other Hispanic or Latino___ Foreign born:___ Other:____No Race Response:___

10) Please choose one:
U.S. citizen:____ Not a U.S. citizen:____

11) Is any portion of your salary funded by a grant?

Yes:____ No:_____

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For each of the following questions, please circle the number on the scale that most closely reflects your degree of agreement or disagreement. Please respond based on your opinion about <u>your</u> institution.

Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1	2	3	4	5

<u>Rights to Faculty Self-Governance</u>

1) The increase in the numbers of non-tenure track positions has reduced faculty input into institutional decision making.

1 2 3 4 5

2) Institutional decisions are arrived at jointly between administration and faculty.

1 2 3 4 5

3) Faculty involvement in institutional decision making has been diminished by the influence of national security interests.

1 2 3 4 5

4) Faculty involvement in institutional decision making has been diminished by the influence of corporate interests.

1 2 3 4 5

5) Faculty involvement in institutional decision making has been diminished by the influence of political demands for educational accountability.

1 2 3 4 5

6) Faculty involvement in institutional decision making has been diminished by the influence of hospital interests.

1 2 3 4 5

7) Faculty involvement in institutional decision making has been diminished by leadership's need to attract external financial support.

1 2 3 4 5

8) Faculty involvement in institutional decisions has been diminished by government funding targeted to specific educational and/or research projects.

1 2 3 4 5

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Institutional autonomy and leadership
(The institution's right to protect itself from political interference into academic affairs)

9) National security interests threaten institutional autonomy.
1 2 3 4 5

10) Hospital market interests have weakened institutional autonomy.
1 2 3 4 5

11) Leadership concerns about raising external funds threaten institutional autonomy.
1 2 3 4 5

12) Reductions in tenure track positions have weakened institutional autonomy.
1 2 3 4 5

13) Political demands for educational results have weakened institutional autonomy.
1 2 3 4 5

14) Leadership does a good job from protecting the institution from external interference with its internal academic affairs.
1 2 3 4 5

15) Corporate interests have weakened institutional autonomy.
1 2 3 4 5

16) Government funding targeted to specific projects diminishes institutional autonomy.
1 2 3 4 5

Teaching and Curriculum

17) Faculty can teach controversial ideas related to their specialties, even if they conflict with political demands for educational accountability.
1 2 3 4 5

18) Faculty can teach controversial ideas related to their specialties, even if they conflict with national security interests
1 2 3 4 5

19) Faculty can teach controversial ideas related to their specialties, even if they conflict with corporate interests.
1 2 3 4 5

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20) Faculty are free to teach controversial ideas related to their specialties.

1 2 3 4 5

21) Faculty can teach controversial ideas related to their specialties, even if they conflict with hospital interests.

1 2 3 4 5

22) The reductions in tenure track positions have inhibited faculty rights to freely teach on issues related to their specialties.

1 2 3 4 5

23) The need for leadership to attract external financial support has inhibited faculty from teaching freely on issues related to their specialties.

1 2 3 4 5

24) Government funding targeted to specific research and/or educational projects diminishes faculty freedom to teach controversial ideas related to their specialties.

1 2 3 4 5

Speaking freely to the academic community (students and faculty) at my institution

25) The reductions in tenure-track positions inhibit faculty from speaking openly on controversial issues related to their specialties.

1 2 3 4 5

26) Faculty can speak openly about controversial ideas that are related to their specialty.

1 2 3 4 5

27) The need for leadership to attract external funding has inhibited faculty from speaking openly on controversial issues related to their specialties.

1 2 3 4 5

28) The influence of corporate interests diminishes faculty freedom to speak openly about controversial issues related to their specialties.

1 2 3 4 5

29) The influence of hospital interests diminishes faculty freedom to speak openly on controversial issues relevant to their specialties.

1 2 3 4 5

30) Concerns over national security interests have diminished faculty freedom to speak openly on controversial issues relevant to their specialties.

1 2 3 4 5

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31) Political demands for educational accountability inhibit faculty from speaking freely on controversial issues related to their specialties.

1 2 3 4 5

32) Government funding targeted to specific projects diminishes faculty freedom to speak freely on controversial ideas related to their specialties.

1 2 3 4 5

Research and publication at your institution

33) The increase in the numbers of non-tenure track positions has diminished faculty control of research and/or dissemination of results.

1 2 3 4 5

34) The faculty has appropriate control over research priorities.

1 2 3 4 5

35) National security interests have diminished faculty control over research and/or publication of results.

1 2 3 4 5

36) Hospital influence has diminished faculty control over research and/or publication of results.

1 2 3 4 5

37) Corporate influence has diminished faculty control over research and/or the publication of results.

1 2 3 4 5

38) The need for leadership to attract external funding has diminished faculty control of research and/or publication of results.

1 2 3 4 5

39) Political demands for educational accountability have diminished faculty control over research and/or the dissemination of results.

1 2 3 4 5

40) Government funding targeted to specific projects has diminished faculty control over research and/or publication of results.

1 2 3 4 5

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If I have questions about your responses, may I contact you by e-mail? Yes:___ No:____

Please indicate if you would you like to receive a summary of the findings of this study via mail? Yes:___No:____

Comments or questions:_____
_____

_____
_____

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Appendix D. Academic Freedom Index

Self-governance	1) The increase in the numbers of non-tenure track positions has reduced faculty input into institutional decision making.
	2) Institutional decisions are arrived at jointly between administration and faculty.
	3) Faculty involvement in institutional decision making has been diminished by the influence of national security interests.
	4) Faculty involvement in institutional decision making has been diminished by the influence of corporate interests.
	5) Faculty involvement in institutional decision making has been diminished by the influence of political demands for educational accountability.
	6) Faculty involvement in institutional decision making has been diminished by the influence of hospital interests.
	7) Faculty involvement in institutional decision making has been diminished by leadership's need to attract external financial support.
	8) Faculty involvement in institutional decisions has been diminished by government funding targeted to specific educational and/or research projects.
Institutional autonomy and leadership	9) National security interests threaten institutional autonomy.
	10) Hospital market interests have weakened institutional autonomy.
	11) Leadership concerns about raising external funds threaten institutional autonomy.
	12) Reductions in tenure track positions have weakened institutional autonomy.
	13) Political demands for educational results have weakened institutional autonomy.

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14) Leadership does a good job from protecting the institution from external interference with its internal academic affairs.

15) Corporate interests have weakened institutional autonomy.

16) Government funding targeted to specific educational and/or research projects diminishes institutional autonomy.

Teaching freely

17) Faculty can teach controversial ideas related to their specialties, even if they conflict with political demands for educational accountability.

18) Faculty can teach controversial ideas related to their specialties, even if they conflict with national security interests

19) Faculty can teach controversial ideas related to their specialties, even if they conflict with corporate interests.

20) Faculty are free to teach controversial ideas related to their specialties.

21) Faculty can teach controversial ideas related to their specialties, even if they conflict with hospital interests.

22) The reductions in tenure track positions have inhibited rights to freely teach on issues related to their specialties.

23) The need for leadership to attract external financial support has inhibited faculty from teaching freely on issues related to their specialties.

24) Government funding targeted to specific research and/or educational projects diminishes faculty freedom to teach controversial ideas related to their specialties.

Speaking freely

25) The reductions in tenure-track positions inhibit faculty from speaking openly on controversial issues related to their specialties.

26) Faculty can speak openly about controversial ideas that are related to their specialty.

27) The need for leadership to attract external funding has inhibited

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faculty from speaking openly on controversial issues related to their specialties.

28) The influence of corporate interests diminishes faculty freedom to speak openly about controversial issues related to their specialties.

29) The influence of hospital interests diminishes faculty freedom to speak openly on controversial issues relevant to their specialties.

30) Concerns over national security interests have diminished faculty freedom to speak openly on controversial issues relevant to their specialties.

31) Political demands for educational accountability inhibit faculty from speaking freely on controversial issues related to their specialties.

32) Government funding targeted to specific research and/or educational projects diminishes faculty freedom to speak freely on controversial ideas related to their specialties.

Researching and publishing freely

33) The increase in the numbers of non-tenure track positions has diminished faculty control of research and/or the publication of results.

34) Faculty have appropriate control over research priorities.

35) National security interests have diminished faculty control over research and/or publication of results.

36) Hospital influence has diminished faculty control over research and/or publication of results.

37) Corporate influence has diminished faculty control over research and/or the publication of results.

38) The need for leadership to attract external funding has diminished faculty control of research and/or publication of results.

39) Political demands for educational accountability have

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diminished faculty control over research and/or the publication of results.

40) Government funding targeted to specific research projects has diminished faculty control over research and/or publication of results.

Positive question about academic freedoms

2) Institutional decisions are arrived at jointly between administration and faculty.

14) Leadership does a good job from protecting the institution from external interference with its internal academic affairs.

20) Faculty are free to teach controversial ideas related to their specialties.

26) Faculty can speak openly about controversial ideas that are related to their specialty.

34) Faculty have appropriate control over research priorities.

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Appendix E. Academic Freedom Threats Index

Reduction in tenure track positions	1) The increase in the numbers of non-tenure track positions has reduced faculty input into institutional decision making. 12) Reductions in tenure track positions have weakened institutional autonomy. 22) The reductions in tenure track positions have inhibited faculty rights to freely teach on issues related to their specialties. 25) The reductions in tenure-track positions inhibit faculty from speaking openly on controversial issues related to their specialties. 33) The increase in the numbers of non-tenure track positions has diminished faculty control of research and/or dissemination of results
Leadership	7) Faculty involvement in institutional decision making has been diminished by leadership's need to attract external financial support. 11) Leadership concerns about raising external funds threaten institutional autonomy. 23) The need for leadership to attract external financial support has inhibited faculty from teaching freely on issues related to their specialties. 27) The need for leadership to attract external funding has inhibited faculty from speaking openly on controversial issues related to their specialties. 38) The need for leadership to attract external funding has diminished faculty control of research and/or publication of results.

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Hospital interests	6) Faculty involvement in institutional decision making has been diminished by the influence of hospital interests. 10) Hospital market interests have weakened institutional autonomy. 21) Faculty can teach controversial ideas related to their specialties, even if they conflict with hospital interests. 29) The influence of hospital interests diminishes faculty freedom to speak openly on controversial issues relevant to their specialties. 36) Hospital influence has diminished faculty control over research and/or publication of results.
National security interests	3) Faculty involvement in institutional decision making has been diminished by the influence of national security interests. 9) National security interests threaten institutional autonomy. 18) Faculty can teach controversial ideas related to their specialties, even if they conflict with national security interests 30) Concerns over national security interests have diminished faculty freedom to speak openly on controversial issues relevant to their specialties. 35) National security interests have diminished faculty control over research and/or publication of results.
Educational accountability	5) Faculty involvement in institutional decision making has been diminished by the influence of political demands for educational accountability. 13) Political demands for educational results have weakened institutional autonomy. 17) Faculty can teach controversial ideas related to their specialties, even if they conflict with political demands for educational accountability.

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	31) Political demands for educational accountability inhibit faculty from speaking freely on controversial issues related to their specialties. 39) Political demands for educational accountability have diminished faculty control over research and/or the dissemination of results
Corporate interests	4) Faculty involvement in institutional decision making has been diminished by the influence of corporate interests. 15) Corporate interests have weakened institutional autonomy. 19) Faculty can teach controversial ideas related to their specialties, even if they conflict with corporate interests. 28) The influence of corporate interests diminishes faculty freedom to speak openly about controversial issues related to their specialties. 37) Corporate influence has diminished faculty control over research and/or the publication of results.
Targeted government funding	8) Faculty involvement in institutional decisions has been diminished by government funding targeted to specific educational and/or research projects. 16) Government funding targeted to specific projects diminishes institutional autonomy. 24) Government funding targeted to specific research and/or educational projects diminishes faculty freedom to teach controversial ideas related to their specialties. 32) Government funding targeted to specific projects diminishes faculty freedom to speak freely on controversial ideas related to their specialties. 40) Government funding targeted to specific projects has diminished faculty control over research and/or publication of results.

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Appendix F. Faculty Recruitment Letter

Shelly Ann Elliott
7411 Stoneman Road
Richmond, VA 23228
e-mail: shellyaelliott@gmail.com
elliottsa3@vcu.edu

July 17, 2009

Dear Faculty Member:

I am writing to invite your voluntary participation in confidential internet survey on academic freedom in medical education and research as part of a dissertation study sponsored by Virginia Commonwealth University (VCU) School of Education. Your institution is one of 12 medical schools selected for study and has approved my request to contact you for your voluntary participation.

This survey is expected to take approximately 13 minutes to complete. Please consider completing the survey within two weeks by accessing the following secure internet link:

https://survey.vcu.edu/cgi-bin/qwebcorporate.dll?idx=G44MN9&preview=1

If at any time during the course of taking the survey you wish to exit, you may do so without penalty and without submitting your responses, even at the end of the survey. You also will have the option to return and pick up where you were previously in the survey in order to complete the survey. In addition, you will be given the opportunity to provide no response for every question.

This study carries the following assurances of confidentiality and data security precautions.

Confidentiality: This study has been approved as educational exempt by the VCU Institutional Review Board (IRB). For the purposes of participant recruitment and data collection for this study only, your institution has granted me permission to contact you either directly via your e-mail address or a listserve to request your voluntary participation.Your institution also may have provided your tenure track information (tenure track, tenured or collateral) and your educational discipline (medicine or basic sciences). If you have been contacted directly by me, then you have been randomly

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selected for inclusion in this study using this information. If you have been contacted via a listserve, all medical and basic sciences faculty in your medical school have been selected for inclusion. Names, social security numbers, employee numbers or other unique identifiers have not been collected.

Each survey response will be assigned a unique number for data organization purposes. In addition, your e-mail address, if provided, will be assigned a unique code number solely for the purpose of tracking participation and not to link your response to your e-mail addresses. All e-mail addresses will be destroyed immediately upon completion of the study.

Your anonymous responses to the survey will be saved on a password-protected database managed by VCU; any published reports and presentations that result from this study will not report your individual responses or identify you by name or any other unique identifier; all computer printouts will be stored in a locked file cabinet; data will be reported in aggregate form only for all schools participating in the study combined and not by individual response or individual school, and your data will be viewed only by the researchers. All members of the research team have completed required training on the protection of human subjects in research.

Accessing the secure internet site at VCU to participate indicates your agreement to conditions of the study and your voluntary consent to participate. At the end of the survey, you will be asked if you would like to receive the study's results. If you would like to receive survey results at the completion of the study, please indicate so in the appropriate place and you will be notified by e-mail with a hypertext link to a secure web site with aggregate results for all schools combined.

Internet security: The internet itself may pose inherent security risks. All reasonable efforts will be made by the researcher**s** and the VCU computing services to maintain security of data on the web site**s**, including software to counteract viruses, scams and other computer related crimes; however, there are no guarantees with any computer system. In addition, the researcher**s** and VCU cannot be responsible for any random checks of e-mails and other computing work by your workplace for issues related to productivity and security. Although VCU computing services maintains standard institutional precautions for the protection and security of data maintained on its servers, it is up to the survey respondents to be responsible for the security of their own computers.

If you have any questions, concerns or comments about this survey before, during or following completion of the survey, please contact Shelly Ann Elliott, MS, doctoral student in education, at either of the above e-mail addresses.

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Thank you in advance for contributing to research related to academic freedom in medical education and research.

Sincerely,

Shelly Ann Elliott, MS

cc: Nora Alder, Ed.D.
Associate Professor, Virginia Commonwealth University

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Appendix G. Institutional Recruitment Letter

Shelly Ann Elliott
7411 Stoneman Road
Richmond, VA 23228
Email: shelly.elliott@dss.virginia.gov

Date

Name: _____, M.D.
Dean, _____
Name of institution: _____
Address: _____
City/State/Zip: _____

Dear Dr._____:

Based upon feedback I have received from some institutions already contacted, I have revised my procedures. I am again requesting your institution's support and voluntary participation in a dissertation study on education and research in academic medicine sponsored by the Virginia Commonwealth University (VCU) School of Education. Your institution is one of 12 medical schools in the mid-Atlantic area and adjacent states that has been selected for study. This study's protocol and procedural changes have been approved by the VCU Institutional Review Board (IRB), carries assurances of confidentiality, and has been determined to be educationally exempt (VCU IRB#HM11955).

Your participation would involve granting me permission to survey medical school faculty (basic sciences and medical disciplines) confidentially via the internet using one of the following methods of your choice:

1) Provide me with a list of faculty e-mail addresses with discipline information (medical or basic sciences) and tenure information (collateral, tenure track or tenured) or a contact from whom I could, with your permission, obtain a faculty e-mail list
2) Grant me permission to access faculty e-mail via your school's web site with tenure and discipline information

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3) Allow me to send the survey to a contact at your institution who then e-mails basic sciences and physician faculty in your medical school using a list serve address.

Options 1 and 2 are preferred as they allow me to randomly select faculty for inclusion based upon the tenure and discipline variables and to send reminder e-mails only to those faculty who have not yet completed the survey. With option 3, no individual faculty e-mail addresses will be collected by researchers or saved on the data set. Only the researchers will have access to the data and no individual data will be reported.

This study includes full and part-time medical school faculty in basic sciences and medical disciplines. The study excludes administrative only faculty; faculty in other health professions such as pharmacy, nursing and dentistry; community preceptors or other faculty who work exclusively outside the medical school setting; residents, students, and other staff. There is no need to provide names or other personally identifying information.

I also am requesting a letter of support from your institution that I would send with the faculty invitation letter. A sample letter for your consideration and the faculty invitation letter are attached (see attachments 1 and 2). The faculty invitation letter describes procedures to assure confidentiality and precautions to maintain security of the data.

Once I have your approval and faculty e-mail addresses or list serve, I will send faculty selected for study your letter of support (if provided) and the faculty recruitment letter, which will include an internet link to the survey on a secure web site at VCU. At the conclusion of the study, you and faculty participants will be provided a secure internet link at VCU with a posting of aggregate results.

The survey is expected to take approximately 13 minutes. Data collected will be used solely for the purpose of the study and all e-mail addresses will be destroyed following completion of the study.

If you agree to participate, please send me a response via e-mail at shelly.elliott@dss.virginia.gov indicating your agreement to participate, which option you prefer for contacting faculty via e-mail, and whether or not you are willing to provide a letter of support using either the sample provided or another letter with your own wording.

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Thank you in advance for your support of this worthwhile project on research and teaching in academic medicine. If you have any questions or concerns, please contact me at directly at (804) 726-7101 or (804) 836-7617.

Sincerely,

Shelly Ann Elliott, MS, Doctoral Student

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Appendix H. Multiple Regression Output Tables for All Independent Variables (Except Correlations and Coefficients)

Table H. 1.

Dependent Variable of Institutional Autonomy

Descriptive Statistics

	Mean	Std. Deviation	N
AUTONOMY	.0000000	1.00000000	102
School category	.490	.5024	102
Tenure track	.6667	.47373	102
Physician	.5392	.50092	102
Rank	.6275	.48587	102
Tenured	.4118	.49458	102
Targeted funding	.4706	.50160	102
Race	.7745	.41997	102
Administrator	.2451	.43227	102
Citizenship	.8824	.32378	102
Gender	.5980	.49272	102

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Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.363[a]	.132	.036	.98165988	.132	1.381	10	91	.202

ANOVA[b]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	13.307	10	1.331	1.381	.202[a]
	Residual	87.693	91	.964		
	Total	101.000	101			

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Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients			95.0% Confidence Interval for B		Collinearity Statistics	
		B	Std. Error	Beta	t	Sig.	Lower Bound	Upper Bound	Toler-ance	VIF
1	(Constant)	-.443	.398		-1.112	.269	-1.234	.348		
	School category	-.006	.222	-.003	-.028	.978	-.446	.434	.770	1.299
	Tenure	-.220	.257	-.104	-.857	.394	-.732	.291	.642	1.558
	Discipline	-.065	.240	-.032	-.270	.787	-.541	.411	.662	1.511
	Rank	-.390	.264	-.189	-1.478	.143	-.914	.134	.581	1.722
	Tenured	.182	.285	.090	.637	.526	-.385	.749	.479	2.087
	Targeted funding	.149	.237	.075	.627	.532	-.323	.620	.673	1.485
	Race	.419	.281	.176	1.490	.140	-.140	.977	.684	1.461
	Administrator	.625	.250	.270	2.504	.014	.129	1.122	.818	1.222
	Citizenship	.048	.353	.016	.136	.892	-.652	.748	.732	1.366
	Gender	.347	.205	.171	1.694	.094	-.060	.754	.937	1.068

a. Dependent Variable: AUTONOMY

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Residuals Statistics[a]

	Minimum	Maximum	Mean	Std. Deviation	N
Predicted Value	-.7230892	1.0805055	.0000000	.36298124	102
Std. Predicted Value	-1.992	2.977	.000	1.000	102
Standard Error of Predicted Value	.223	.477	.318	.055	102
Adjusted Predicted Value	-.8495042	1.0962391	.0044355	.38231131	102
Residual	-2.56324220	2.53085947	.00000000	.93179645	102
Std. Residual	-2.611	2.578	.000	.949	102
Stud. Residual	-2.834	2.709	-.002	1.003	102
Deleted Residual	-3.02024746	2.79451323	-.00443555	1.04050697	102
Stud. Deleted Residual	-2.952	2.810	-.002	1.016	102
Mahal. Distance	4.203	22.884	9.902	3.773	102
Cook's Distance	.000	.130	.011	.018	102
Centered Leverage Value	.042	.227	.098	.037	102

a. Dependent Variable: AUTONOMY

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Table H. 2.

Dependent Variable of Faculty Governance

Descriptive Statistics

	Mean	Std. Deviation	N
Faculty Governance	.0000000	1.00000000	107
Targeted funding	.4673	.50128	107
Administrator	.2430	.43091	107
Citizenship	.8879	.31704	107
Gender	.6075	.49061	107
Tenure	.4206	.49597	107
Rank	.6449	.48081	107
Discipline	.5607	.49863	107
Race	.7757	.41908	107
School category	.486	.5022	107
Tenure track	.6729	.47136	107

Model Summary

					Change Statistics				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	R Square Change	F Change	df1	df2	Sig. F Change
1	.364[a]	.133	.042	.97856507	.133		10	96	.163

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ANOVA

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	14.071	10	1.407	1.469	.163[a]
	Residual	91.929	96	.958		
	Total	106.000	106			

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Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients			95.0% Confidence Interval for B		Collinearity Statistics	
		B	Std. Error	Beta	t	Sig.	Lower Bound	Upper Bound	Tolerance	VIF
1	(Constant)	.364	.389		.933	.353	-.410	1.137		
	Salary	.331	.226	.166	1.465	.146	-.117	.779	.705	1.418
	Administrator	-.611	.243	-.263	-2.518	.013	-1.092	-.129	.827	1.209
	Citizenship	-.043	.349	-.014	-.123	.902	-.737	.651	.736	1.358
	Gender	-.202	.199	-.099	-1.013	.314	-.597	.194	.946	1.057
	Tenured	-.193	.273	-.096	-.709	.480	-.734	.348	.494	2.024
	Rank	.239	.256	.115	.931	.354	-.270	.747	.596	1.679
	Physician	.137	.228	.069	.602	.548	-.315	.590	.698	1.432
	Race	-.386	.268	-.162	-1.437	.154	-.919	.147	.714	1.401
	School category	-.188	.217	-.094	-.866	.388	-.619	.243	.759	1.317
	Tenure track	.048	.257	.022	.186	.853	-.462	.557	.617	1.620

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Residuals Statistics

	Minimum	Maximum	Mean	Std. Deviation	N
Predicted Value	-.8354806	.8391218	.0000000	.36434741	107
Std. Predicted Value	-2.293	2.303	.000	1.000	107
Standard Error of Predicted Value	.219	.468	.309	.054	107
Adjusted Predicted Value	-.8000742	.8355013	-.0023820	.38218686	107
Residual	-2.10969138	2.31226897	.00000000	.93126310	107
Std. Residual	-2.156	2.363	.000	.952	107
Stud. Residual	-2.269	2.470	.001	1.002	107
Deleted Residual	-2.33716369	2.52663207	.00238201	1.03319884	107
Stud. Deleted Residual	-2.320	2.539	.000	1.012	107
Mahal. Distance	4.312	23.297	9.907	3.851	107
Cook's Distance	.000	.065	.010	.014	107
Centered Leverage Value	.041	.220	.093	.036	107

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Table H. 3.

Freedom to speak

Descriptive Statistics

	Mean	Std. Deviation	N
Speaking	.0000000	1.00000000	89
School category	.517	.5025	89
Tenure track	.6742	.47134	89
Discipline	.5393	.50128	89
Rank	.6180	.48863	89
Tenured	.4157	.49564	89
Targeted funding	.4719	.50204	89
Race	.7640	.42700	89
Citizenship	.8764	.33098	89
Gender	.6067	.49124	89
Administrator	.2360	.42700	89

Model Summary[b]

					Change Statistics				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	R Square Change	F Change	df1	df2	Sig. F Change
1	.441[a]	.195	.092	.95309646	.195	1.887	10	78	.059

a. Predictors: (Constant), Administrator, Race, Gender, School category, Citizenship, Tenured, Tenure Track, Targeted Funding, Rank, Discipline

b. Dependent Variable: Speaking

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ANOVA[b]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	17.145	10	1.715	1.887	.059[a]
	Residual	70.855	78	.908		
	Total	88.000	88			

a. Predictors: (Constant), Administrator, Rank, Gender, Race, Citizenship, Tenured, Tenure Track, School Category, Targeted Funding, Discipline, Rank

b. Dependent Variable: Speaking

Coefficients[a]

Model	Unstandar-dized Coefficients		Standar-dized Coefficients			95.0% Confidence Interval for B		Collinearity Statistics	
	B	Std. Error	Beta	t	Sig.	Lower Bound	Upper Bound	Toler-ance	VIF
1 (Constant)	.795	.406		1.958	.054	-.013	1.602		
School category	.124	.249	.063	.500	.619	-.371	.620	.660	1.516
Tenure track	-.002	.269	.000	-.008	.994	-.538	.534	.641	1.561
Discipline	-.020	.259	-.010	-.079	.938	-.536	.495	.613	1.632
Rank	.670	.277	.328	2.416	.018	.118	1.223	.562	1.780
Tenured	-.455	.299	-.226	-1.520	.133	-1.051	.141	.469	2.132
Targeted Funding	.051	.262	.025	.194	.847	-.470	.572	.598	1.672
Race	-.422	.287	-.180	-1.472	.145	-.993	.149	.688	1.453
Citizenship	-.379	.354	-.125	-1.068	.289	-1.084	.327	.750	1.333
Gender	-.611	.226	-.300	-2.702	.008	-1.061	-.161	.837	1.194
Administrator	-.299	.267	-.128	-1.118	.267	-.831	.233	.792	1.263

a. Dependent Variable: Speaking

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Residuals Statistics[a]

	Minimum	Maximum	Mean	Std. Deviation	N
Predicted Value	-.8856082	1.0293425	.0000000	.44139959	89
Std. Predicted Value	-2.006	2.332	.000	1.000	89
Standard Error of Predicted Value	.228	.493	.330	.056	89
Adjusted Predicted Value	-.8938814	1.1205531	-.0038977	.46512975	89
Residual	-2.19551778	2.07784224	.00000000	.89731065	89
Std. Residual	-2.304	2.180	.000	.941	89
Stud. Residual	-2.444	2.322	.002	1.002	89
Deleted Residual	-2.47212338	2.35692024	.00389774	1.01840366	89
Stud. Deleted Residual	-2.527	2.391	.001	1.014	89
Mahal. Distance	4.064	22.510	9.888	3.709	89
Cook's Distance	.000	.068	.012	.016	89
Centered Leverage Value	.046	.256	.112	.042	89

a. Dependent Variable: Speaking

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Table H. 4.

Freedom to research

Descriptive Statistics

	Mean	Std. Deviation	N
Research	.0000000	1.00000000	94
School category	.511	.5026	94
Tenure track	.6702	.47266	94
Discipline	.5426	.50086	94
Rank	.6383	.48307	94
Tenured	.4255	.49707	94
Targeted Funding	.4574	.50086	94
Race	.7660	.42567	94
Citizeship	.8830	.32317	94
Gender	.6064	.49117	94
Administrator	.2447	.43220	94

Model Summary[b]

					Change Statistics				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	R Square Change	F Change	df1	df2	Sig. F Change
1	.354[a]	.126	.020	.98985708	.126	1.192	10	83	.309

a. Predictors: (Constant), Administrator, Gender, Targeted Funding, Race, Tenure track, Rank, Citizenship, School category, Discipline, Tenured

b. Dependent Variable: Research

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ANOVA[b]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	11.675	10	1.168	1.192	.309[a]
	Residual	81.325	83	.980		
	Total	93.000	93			

a. Predictors: (Constant), Administrator, Gender, Targeted funding, Race, Tenure track, Rank, citizenship, School category, Discipline, Tenured

b. Dependent Variable: Research

Coefficients[a]

Model	Unstandardized Coefficients		Standardized Coefficients			95.0% Confidence Interval for B		Collinearity Statistics	
	B	Std. Error	Beta	t	Sig.	Lower Bound	Upper Bound	Tolerance	VIF
1 (Constant)	-.597	.419		-1.425	.158	-1.431	.237		
School category	.371	.239	.187	1.551	.125	-.105	.847	.729	1.372
Tenure track	.318	.278	.150	1.147	.255	-.234	.871	.612	1.634
DISCIPLINE	-.116	.261	-.058	-.443	.659	-.635	.404	.615	1.625
Rank	-.417	.281	-.202	-1.486	.141	-.976	.141	.573	1.746
Tenured	.042	.303	.021	.137	.891	-.561	.645	.464	2.156
Targeted funding	-.010	.263	-.005	-.037	.971	-.533	.514	.606	1.649
Race	.268	.290	.114	.923	.359	-.309	.845	.691	1.446
Citizenship	.228	.366	.074	.623	.535	-.500	.957	.752	1.330
Gender	-.012	.220	-.006	-.056	.956	-.449	.424	.906	1.104
Administrator	.454	.262	.196	1.736	.086	-.066	.974	.824	1.213

a. Dependent Variable: Research

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Residuals Statistics[a]

	Minimum	Maximum	Mean	Std. Deviation	N
Predicted Value	-.7252381	.6710450	.0000000	.35431573	94
Std. Predicted Value	-2.047	1.894	.000	1.000	94
Standard Error of Predicted Value	.228	.505	.334	.058	94
Adjusted Predicted Value	-.8063045	.8484406	-.0036305	.37344960	94
Residual	-2.18400621	2.06975722	.00000000	.93512585	94
Std. Residual	-2.206	2.091	.000	.945	94
Stud. Residual	-2.307	2.257	.002	1.001	94
Deleted Residual	-2.38784838	2.41250181	.00363052	1.05009611	94
Stud. Deleted Residual	-2.370	2.315	.003	1.011	94
Mahal. Distance	3.946	23.173	9.894	3.779	94
Cook's Distance	.000	.077	.011	.015	94
Centered Leverage Value	.042	.249	.106	.041	94

a. Dependent Variable: Research

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Table H. 5.

Freedom to teach

Descriptive Statistics

	Mean	Std. Deviation	N
Teach	.0000000	1.00000000	94
School category	.511	.5026	94
Tenure track	.7021	.45978	94
Discipline	.5319	.50166	94
Rank	.6383	.48307	94
Tenured	.4362	.49857	94
Targeted funding	.5000	.50268	94
Race	.7872	.41146	94
Citizenship	.8830	.32317	94
Gender	.6170	.48872	94
Administrator	.2447	.43220	94

Model Summary[b]

					Change Statistics				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	R Square Change	F Change	df1	df2	Sig. F Change
1	.429[a]	.184	.086	.95617867	.184	1.872	10	83	.061

a. Predictors: (Constant), Administrator, Targeted funding, Gender, Race, Tenure track, Citizenship, Rank, School category, DISCIPLINE, Tenured

b. Dependent Variable: Teach

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ANOVA[b]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	17.115	10	1.711	1.872	.061[a]
	Residual	75.885	83	.914		
	Total	93.000	93			

a. Predictors: (Constant), Administrator, Targeted funding, Gender, Race, Tenure track, Citizenship, Rank, School category, DISCIPLINE, Tenured

b. Dependent Variable: Teaching

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Coefficients[a]

Model	Unstandardized Coefficients B	Unstandardized Coefficients Std. Error	Standardized Coefficients Beta	t	Sig.	95.0% Confidence Interval for B Lower Bound	95.0% Confidence Interval for B Upper Bound	Collinearity Statistics Tolerance	Collinearity Statistics VIF
1 (Constant)	.791	.403		1.960	.053	-.012	1.593		
School category	-.156	.244	-.078	-.637	.526	-.641	.330	.653	1.531
Tenure track	.264	.277	.121	.953	.343	-.287	.815	.606	1.652
DISCIPLINE	-.274	.256	-.138	-1.073	.286	-.783	.234	.598	1.672
Rank	.676	.292	.327	2.314	.023	.095	1.258	.493	2.028
Tenured	-.539	.312	-.269	-1.730	.087	-1.159	.081	.408	2.454
Targeted funding	.228	.266	.115	.860	.392	-.300	.757	.551	1.814
Race	-.339	.296	-.140	-1.148	.254	-.928	.249	.664	1.506
Citizenship	-.500	.361	-.162	-1.386	.169	-1.218	.218	.723	1.383
Gender	-.467	.215	-.228	-2.172	.033	-.894	-.039	.891	1.122
Administrator	-.265	.255	-.114	-1.039	.302	-.771	.242	.811	1.234

a. Dependent Variable: Teaching

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Residuals Statistics[a]

	Minimum	Maximum	Mean	Std. Deviation	N
Predicted Value	-.9455657	1.1276294	.0000000	.42898925	94
Std. Predicted Value	-2.204	2.629	.000	1.000	94
Standard Error of Predicted Value	.216	.435	.322	.057	94
Adjusted Predicted Value	-1.1942843	1.1832851	-.0014228	.45664856	94
Residual	-1.89578104	2.03488946	.00000000	.90330959	94
Std. Residual	-1.983	2.128	.000	.945	94
Stud. Residual	-2.103	2.198	.001	1.006	94
Deleted Residual	-2.15670609	2.27043247	.00142282	1.02659518	94
Stud. Deleted Residual	-2.148	2.251	.001	1.018	94
Mahal. Distance	3.752	18.243	9.894	3.766	94
Cook's Distance	.000	.106	.013	.020	94
Centered Leverage Value	.040	.196	.106	.040	94

a. Dependent Variable: Teaching

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Table H. 5.

Freedom to teach

Descriptive Statistics

	Mean	Std. Deviation	N
Teach	.0000000	1.00000000	94
School category	.511	.5026	94
Tenure track	.7021	.45978	94
Discipline	.5319	.50166	94
Rank	.6383	.48307	94
Tenured	.4362	.49857	94
Targeted funding	.5000	.50268	94
Race	.7872	.41146	94
Citizenship	.8830	.32317	94
Gender	.6170	.48872	94
Administrator	.2447	.43220	94

Model Summary[b]

					Change Statistics				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	R Square Change	F Change	df1	df2	Sig. F Change
1	.429[a]	.184	.086	.95617867	.184	1.872	10	83	.061

a. Predictors: (Constant), Administrator, Targeted funding, Gender, Race, Tenure track, Citizenship, Rank, School category, DISCIPLINE, Tenured

b. Dependent Variable: Teach

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ANOVA[b]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	17.115	10	1.711	1.872	.061[a]
	Residual	75.885	83	.914		
	Total	93.000	93			

a. Predictors: (Constant), Administrator, Targeted funding, Gender, Race, Tenure track, Citizenship, Rank, School category, DISCIPLINE, Tenured

b. Dependent Variable: Teaching

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Coefficients[a]

Model	Unstandardized Coefficients B	Unstandardized Coefficients Std. Error	Standardized Coefficients Beta	t	Sig.	95.0% Confidence Interval for B Lower Bound	95.0% Confidence Interval for B Upper Bound	Collinearity Statistics Tolerance	Collinearity Statistics VIF
1 (Constant)	.791	.403		1.960	.053	-.012	1.593		
School category	-.156	.244	-.078	-.637	.526	-.641	.330	.653	1.531
Tenure track	.264	.277	.121	.953	.343	-.287	.815	.606	1.652
DISCIPLINE	-.274	.256	-.138	-1.073	.286	-.783	.234	.598	1.672
Rank	.676	.292	.327	2.314	.023	.095	1.258	.493	2.028
Tenured	-.539	.312	-.269	-1.730	.087	-1.159	.081	.408	2.454
Targeted funding	.228	.266	.115	.860	.392	-.300	.757	.551	1.814
Race	-.339	.296	-.140	-1.148	.254	-.928	.249	.664	1.506
Citizenship	-.500	.361	-.162	-1.386	.169	-1.218	.218	.723	1.383
Gender	-.467	.215	-.228	-2.172	.033	-.894	-.039	.891	1.122
Administrator	-.265	.255	-.114	-1.039	.302	-.771	.242	.811	1.234

a. Dependent Variable: Teaching

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Residuals Statistics[a]

	Minimum	Maximum	Mean	Std. Deviation	N
Predicted Value	-.9455657	1.1276294	.0000000	.42898925	94
Std. Predicted Value	-2.204	2.629	.000	1.000	94
Standard Error of Predicted Value	.216	.435	.322	.057	94
Adjusted Predicted Value	-1.1942843	1.1832851	-.0014228	.45664856	94
Residual	-1.89578104	2.03488946	.00000000	.90330959	94
Std. Residual	-1.983	2.128	.000	.945	94
Stud. Residual	-2.103	2.198	.001	1.006	94
Deleted Residual	-2.15670609	2.27043247	.00142282	1.02659518	94
Stud. Deleted Residual	-2.148	2.251	.001	1.018	94
Mahal. Distance	3.752	18.243	9.894	3.766	94
Cook's Distance	.000	.106	.013	.020	94
Centered Leverage Value	.040	.196	.106	.040	94

a. Dependent Variable: Teaching

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Appendix I. Correlations for All Dependent Variables and All Independent Variables

Table I.1.

Correlations for Dependent Variable Institutional Autonomy and All Independent Variables (Except Physician Specialty)

Correlations

		Autonomy	School category	Tenure track	Discipline	Rank	Tenured	Targeted funding	Race	Administrator	Citizenship	Gender
Pearson Corre-lation	Autonomy	1.000	.001	.024	-.003	-.002	.066	.074	.152	.244	.077	.165
	School category	.001	1.000	-.055	-.274	.025	.056	.411	-.081	-.148	-.129	.084
	Tenure track	.024	-.055	1.000	-.195	.272	.549	.083	.315	.210	.194	.014
	Discipline	-.003	-.274	-.195	1.000	.061	-.226	-.468	.019	.207	.090	.085
	Rank	-.002	.025	.272	.061	1.000	.562	-.005	.361	.298	.285	.113
	tenured	.066	.056	.549	-.226	.562	1.000	.129	.308	.218	.244	.036
	Targeted funding	.074	.411	.083	-.468	-.005	.129	1.000	.086	-.081	-.022	-.068
	Race	.152	-.081	.315	.019	.361	.308	.086	1.000	.144	.458	-.012
	Administrator	.244	-.148	.210	.207	.298	.218	-.081	.144	1.000	.208	.095
	Citizenship	.077	-.129	.194	.090	.285	.244	-.022	.458	.208	1.000	-.113
	Gender	.165	.084	.014	.085	.113	.036	-.068	-.012	.095	-.113	1.000

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Sig. (1-tailed)	.										
	Autonomy		.498	.407	.488	.491	.255	.231	.063	.007	.222	.049
	School category	.498	.	.290	.003	.400	.287	.000	.209	.068	.098	.201
	Tenure track	.407	.290	.	.025	.003	.000	.203	.001	.017	.026	.444
	Discipline	.488	.003	.025	.	.273	.011	.000	.425	.019	.185	.199
	Rank	.491	.400	.003	.273	.	.000	.481	.000	.001	.002	.130
	Tenured	.255	.287	.000	.011	.000	.	.098	.001	.014	.007	.360
	Targeted funding	.231	.000	.203	.000	.481	.098	.	.196	.210	.415	.247
	Race	.063	.209	.001	.425	.000	.001	.196	.	.075	.000	.453
	Administrator	.007	.068	.017	.019	.001	.014	.210	.075	.	.018	.170
	Citizenship	.222	.098	.026	.185	.002	.007	.415	.000	.018	.	.129
	Gender	.049	.201	.444	.199	.130	.360	.247	.453	.170	.129	.

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Table I. 2

Correlations for Dependent Variable Faculty Governance and All Independent Variables (Except Physician Specialty)

Sig. (1-tailed)	Faculty Governance	Targeted funding	Administrator	Citizenship	Gender	Tenure	Rank	Discipline	Race	School	Tenure track
		.101	.002	.156	.104	.108	.252	.396	.035	.459	.124
Targeted funding	.101	.	.079	.406	.295	.222	.309	.000	.461	.000	.290
Administrator	.002	.079	.	.019	.157	.032	.002	.007	.064	.051	.015
Citizenship	.156	.406	.019	.	.144	.006	.001	.145	.000	.094	.023
Gender	.104	.295	.157	.144	.	.255	.197	.157	.422	.290	.299
Tenured	.108	.222	.032	.006	.255	.	.000	.048	.002	.480	.000
Rank	.252	.309	.002	.001	.197	.000	.	.091	.001	.416	.002
Discipline	.396	.000	.007	.145	.157	.048	.091	.	.416	.002	.035
Race	.035	.461	.064	.000	.422	.002	.001	.416	.	.141	.000
School category	.459	.000	.051	.094	.290	.480	.416	.002	.141	.	.208
Tenure track	.124	.290	.015	.023	.299	.000	.002	.035	.000	.208	.

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Table I. 3.
Freedom to speak

Correlations

		Speak	School cate-gory	Tenure track	DISCIPLINE	Rank	Tenured	Targeted funding	Race	Citizenship	Gender	Administra-tor
Pearson Correla-tion	Speak	1.000	.059	-.135	-.078	.009	-.138	.044	-.201	-.182	-.232	-.208
	School category	.059	1.000	.000	-.352	-.020	.086	.464	-.061	-.158	.188	-.257
	Tenure track	-.135	.000	1.000	-.210	.243	.538	.081	.291	.176	-.020	.217
	Discipline	-.078	-.352	-.210	1.000	.062	-.181	-.526	.070	.132	.133	.195
	Rank	.009	-.020	.243	.062	1.000	.569	.002	.380	.267	.172	.274
	Tenured	-.138	.086	.538	-.181	.569	1.000	.162	.308	.248	-.021	.229
	Targeted funding	.044	.464	.081	-.526	.002	.162	1.000	.101	.013	-.068	-.154
	Race	-.201	-.061	.291	.070	.380	.308	.101	1.000	.435	-.014	.184
	Citizenship	-.182	-.158	.176	.132	.267	.248	.013	.435	1.000	-.093	.209
	Gender	-.232	.188	-.020	.133	.172	-.021	-.068	-.014	-.093	1.000	.122
	Admini-strator	-.208	-.257	.217	.195	.274	.229	-.154	.184	.209	.122	1.000

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		Speak	School category	Tenure track	Discipline	Rank	Tenured	Targeted funding	Race	Citizenship	Gender	Administrator
Sig. (1-tailed)	Speak	.	.291	.104	.233	.468	.099	.340	.029	.044	.014	.025
	School category	.291	.	.498	.000	.427	.213	.000	.286	.069	.039	.008
	Tenure track	.104	.498	.	.024	.011	.000	.225	.003	.050	.427	.021
	Discipline	.233	.000	.024	.	.282	.045	.000	.256	.108	.107	.033
	Rank	.468	.427	.011	.282	.	.000	.492	.000	.006	.054	.005
	Tenured	.099	.213	.000	.045	.000	.	.065	.002	.010	.423	.015
	Targeted funding	.340	.000	.225	.000	.492	.065	.	.173	.452	.262	.074
	Race	.029	.286	.003	.256	.000	.002	.173	.	.000	.448	.042
	Citizenship	.044	.069	.050	.108	.006	.010	.452	.000	.	.194	.025
	Gender	.014	.039	.427	.107	.054	.423	.262	.448	.194	.	.127
	Administrator	.025	.008	.021	.033	.005	.015	.074	.042	.025	.127	.

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Table I. 4.
Freedom to research

Correlations

		Research	School category	Tenure track	Discipline	Rank	Tenure track	Targeted funding	Race	Citizenship	Gender	Administrator
Pearson Correlation	Research	1.000	.132	.204	-.115	-.050	.104	.116	.131	.101	.001	.151
	School category	.132	1.000	-.053	-.301	-.028	.025	.429	-.089	-.158	.126	-.235
	Tenure track	.204	-.053	1.000	-.235	.225	.558	.099	.307	.167	.037	.189
	Discipline	-.115	-.301	-.235	1.000	.064	-.203	-.528	.047	.131	.091	.175
	Rank	-.050	-.028	.225	.064	1.000	.558	-.020	.368	.277	.164	.274
	Tenured	.104	.025	.558	-.203	.558	1.000	.160	.323	.246	.033	.211
	Targeted funding	.116	.429	.099	-.528	-.020	.160	1.000	.104	.002	-.047	-.125
	Race	.131	-.089	.307	.047	.368	.323	.104	1.000	.424	.018	.139
	Citizenship	.101	-.158	.167	.131	.277	.246	.002	.424	1.000	-.090	.207
	Gender	.001	.126	.037	.091	.164	.033	-.047	.018	-.090	1.000	.104
	Administrator	.151	-.235	.189	.175	.274	.211	-.125	.139	.207	.104	1.000

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		Research	School category	Ten-ure track	Discipli ne	Rank	Tenure track	Targeted funding	Race	Citizen-ship	Gender	Admini-strator
Sig. (1-tailed)	Research	.	.103	.024	.134	.317	.160	.133	.104	.167	.495	.073
	School category	.103	.	.306	.002	.393	.406	.000	.197	.064	.113	.011
	Tenure track	.024	.306	.	.011	.014	.000	.171	.001	.054	.362	.034
	Discipline	.134	.002	.011	.	.269	.025	.000	.326	.105	.192	.046
	Rank	.317	.393	.014	.269	.	.000	.425	.000	.003	.057	.004
	Tenured	.160	.406	.000	.025	.000	.	.062	.001	.008	.377	.021
	Targeted funding	.133	.000	.171	.000	.425	.062	.	.159	.492	.327	.115
	Race	.104	.197	.001	.326	.000	.001	.159	.	.000	.433	.090
	Citizenship	.167	.064	.054	.105	.003	.008	.492	.000	.	.194	.023
	Gender	.495	.113	.362	.192	.057	.377	.327	.433	.194	.	.159
	Administrator	.073	.011	.034	.046	.004	.021	.115	.090	.023	.159	.

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Table I. 5

Freedom to teach

Correlations

		Teach	School category	Tenure track	Disci-pline	Rank	Tenured	Targeted funding	Race	Citizen-ship	Gender	Administra-tor
Pearson Corre-lation	Teach	1.000	.023	.003	-.192	.019	-.068	.119	-.136	-.185	-.237	-.158
	School category	.023	1.000	.014	-.321	-.028	.046	.511	-.041	-.158	.148	-.185
	Tenure track	.003	.014	1.000	-.191	.284	.573	.047	.287	.197	-.035	.208
	Discipline	-.192	-.321	-.191	1.000	.093	-.207	-.512	.033	.123	.138	.236
	Rank	.019	-.028	.284	.093	1.000	.617	.000	.420	.277	.136	.274
	Tenured	-.068	.046	.573	-.207	.617	1.000	.150	.300	.253	.031	.198
	Targeted funding	.119	.511	.047	-.512	.000	.150	1.000	.104	.033	-.088	-.074
	Race	-.136	-.041	.287	.033	.420	.300	.104	1.000	.458	.018	.175
	Citizenship	-.185	-.158	.197	.123	.277	.253	.033	.458	1.000	-.083	.207
	Gender	-.237	.148	-.035	.138	.136	.031	-.088	.018	-.083	1.000	.092
	Admini-strator	-.158	-.185	.208	.236	.274	.198	-.074	.175	.207	.092	1.000

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		Teach	School category	Tenure track	Discipline	Rank	Tenured	Targeted funding	Race	Citizenship	Gender	Administrator
Sig. (1-tailed)	Teach	.	.411	.488	.032	.427	.258	.126	.096	.037	.011	.064
	School category	.411	.	.447	.001	.393	.331	.000	.348	.064	.077	.037
	Tenure track	.488	.447	.	.032	.003	.000	.328	.003	.028	.370	.022
	Discipline	.032	.001	.032	.	.188	.023	.000	.375	.119	.092	.011
	Rank	.427	.393	.003	.188	.	.000	.500	.000	.003	.096	.004
	Tenured	.258	.331	.000	.023	.000	.	.074	.002	.007	.383	.028
	Targeted funding	.126	.000	.328	.000	.500	.074	.	.159	.376	.201	.239
	Race	.096	.348	.003	.375	.000	.002	.159	.	.000	.431	.046
	Citizenship	.037	.064	.028	.119	.003	.007	.376	.000	.	.214	.023
	Gender	.011	.077	.370	.092	.096	.383	.201	.431	.214	.	.189
	Administrator	.064	.037	.022	.011	.004	.028	.239	.046	.023	.189	.

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Appendix J. Stepwise Regression Output Tables

Table J. 1.

Institutional Autonomy

Descriptive Statistics

	Mean	Std. Deviation	N
Autonomy	.0000000	1.00000000	102
School category	.490	.5024	102
Tenure track	.6667	.47373	102
Discipline	.5392	.50092	102
Rank	.6275	.48587	102
Tenured	.4118	.49458	102
Targeted funding	.4706	.50160	102
Race	.7745	.41997	102
Citizenship	.8824	.32378	102
Gender	.5980	.49272	102
Administrator	.2451	.43227	102

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Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.244[a]	.060	.050	.97455320	.060	6.343	1	100	.013

a. Predictors: (Constant), Administrator

b. Dependent Variable: AUTONOMY

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ANOVA[b]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	6.025	1	6.025	6.343	.013[a]
	Residual	94.975	100	.950		
	Total	101.000	101			

a. Predictors: (Constant), Administrator

b. Dependent Variable: AUTONOMY

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Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients			95.0% Confidence Interval for B		Collinearity Statistics	
		B	Std. Error	Beta	t	Sig.	Low-er Bound	Up-per Bound	Toler-ance	VIF
1	(Constant)	-.138	.111		-1.247	.215	-.359	.082		
	Administrator	.565	.224	.244	2.519	.013	.120	1.010	1.000	1.000

a. Dependent Variable: AUTONOMY

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Residuals Statistics[a]

	Minimum	Maximum	Mean	Std. Deviation	N
Predicted Value	-.1384806	.4265202	.0000000	.24423261	102
Std. Predicted Value	-.567	1.746	.000	1.000	102
Standard Error of Predicted Value	.111	.195	.132	.036	102
Adjusted Predicted Value	-.1634708	.4991483	.0000000	.24552544	102
Residual	-2.71985221	2.60121918	.00000000	.96971668	102
Std. Residual	-2.791	2.669	.000	.995	102
Stud. Residual	-2.809	2.724	.000	1.006	102
Deleted Residual	-2.75563979	2.70960331	.00000000	.99140746	102
Stud. Deleted Residual	-2.912	2.817	.001	1.019	102
Mahal. Distance	.321	3.050	.990	1.179	102
Cook's Distance	.000	.155	.011	.023	102
Centered Leverage Value	.003	.030	.010	.012	102

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Table J. 2.

Faculty Governance

Descriptive Statistics

	Mean	Std. Deviation	N
Faculty Governance	.0000000	1.00000000	107
Targeted Funding	.4673	.50128	107
Administrator	.2430	.43091	107
Citizenship	.8879	.31704	107
Gender	.6075	.49061	107
Tenured	.4206	.49597	107
Rank	.6449	.48081	107
Discipline	.5607	.49863	107
Race	.7757	.41908	107
School category	.486	.5022	107
Tenure track	.6729	.47136	107

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Academic Freedom

ANOVA

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	7.788	1	7.788	8.326	.005[a]
	Residual	98.212	105	.935		
	Total	106.000	106			

a. Predictors: (Constant), Administrator

b. Dependent Variable: Faculty Governance

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Academic Freedom

Coefficients

Model		Unstandardized Coefficients		Standard-ized Coeffi-cients			95.0% Confidence Interval for B		Collinearity Statistics	
		B	Std. Error	Beta	t	Sig.	Lower Bound	Upper Bound	Toler-ance	VIF
1	(Constant)	.153	.107		1.422	.158	-.060	.366		
	Administrator	-.629	.218	-.271	-2.885	.005	-1.061	-.197	1.000	1.000

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Dependent Variable: Faculty Governance

Residuals Statistics

	Minimum	Maximum	Mean	Std. Deviation	N
Predicted Value	-.4761747	.1528462	.0000000	.27105001	107
Std. Predicted Value	-1.757	.564	.000	1.000	107
Standard Error of Predicted Value	.107	.190	.127	.035	107
Adjusted Predicted Value	-.5551860	.1761000	.0000000	.27240623	107
Residual	-2.45905399	2.27934480	.00000000	.96256527	107
Std. Residual	-2.543	2.357	.000	.995	107
Stud. Residual	-2.593	2.371	.000	1.007	107
Deleted Residual	-2.55741620	2.30783677	.00000000	.98640519	107
Stud. Deleted Residual	-2.667	2.426	-.001	1.017	107
Mahal. Distance	.318	3.086	.991	1.193	107
Cook's Distance	.000	.134	.012	.025	107
Centered Leverage Value	.003	.029	.009	.011	107

a. Dependent Variable: Faculty Governance

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Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.271[a]	.073	.065	.96713805	.073	8.326	1	105	.005

a. Predictors: (Constant), Administrator

b. Dependent Variable: Faculty Governance

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Table J. 3

Freedom to speak

Descriptive Statistics

	Mean	Std. Deviation	N
Speaking	.0000000	1.00000000	89
School category	.517	.5025	89
Tenure track	.6742	.47134	89
Discipline	.5393	.50128	89
Rank	.6180	.48863	89
Tenured	.4157	.49564	89
Salary	.4719	.50204	89
Race	.7640	.42700	89
Citizenship	.8764	.33098	89
Gender	.6067	.49124	89
Administrator	.2360	.42700	89

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Model Summary[c]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.232[a]	.054	.043	.97833826	.054	4.940	1	87	.029
2	.309[b]	.096	.074	.96203230	.042	3.974	1	86	.049

a. Predictors: (Constant), gender

b. Predictors: (Constant), gender, race

c. Dependent Variable: SPEAK

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ANOVA[c]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	4.728	1	4.728	4.940	.029[a]
	Residual	83.272	87	.957		
	Total	88.000	88			
2	Regression	8.406	2	4.203	4.542	.013[b]
	Residual	79.594	86	.926		
	Total	88.000	88			

a. Predictors: (Constant), gender

b. Predictors: (Constant), gender, race

c. Dependent Variable: SPEAK

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Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95.0% Confidence Interval for B		Collinearity Statistics	
		B	Std. Error	Beta			Lower Bound	Upper Bound	Tolerance	VIF
1	(Constant)	.286	.165		1.731	.087	-.042	.615		
	gender	-.472	.212	-.232	-2.223	.029	-.894	-.050	1.000	1.000
2	(Constant)	.656	.247		2.660	.009	.166	1.146		
	gender	-.478	.209	-.235	-2.288	.025	-.893	-.063	1.000	1.000
	race	-.479	.240	-.204	-1.994	.049	-.956	-.001	1.000	1.000

a. Dependent Variable: SPEAK

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Residuals Statistics[a]

	Minimum	Maximum	Mean	Std. Deviation	N
Predicted Value	-.3008405	.6556891	.0000000	.30907619	89
Std. Predicted Value	-.973	2.121	.000	1.000	89
Standard Error of Predicted Value	.143	.247	.173	.036	89
Adjusted Predicted Value	-.3446726	.7480750	.0000285	.31177477	89
Residual	-2.20356631	1.93671155	.00000000	.95103728	89
Std. Residual	-2.291	2.013	.000	.989	89
Stud. Residual	-2.328	2.036	.000	1.004	89
Deleted Residual	-2.27600765	1.98054361	-.00002848	.98180424	89
Stud. Deleted Residual	-2.391	2.075	-.002	1.014	89
Mahal. Distance	.959	4.790	1.978	1.305	89
Cook's Distance	.000	.067	.011	.014	89
Centered Leverage Value	.011	.054	.022	.015	89

a. Dependent Variable: SPEAK

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Table J. 4.

Freedom to research

Descriptive Statistics

	Mean	Std. Deviation	N
Research	.0000000	1.00000000	94
School category	.511	.5026	94
Tenure track	.6702	.47266	94
Discipline	.5426	.50086	94
Rank	.6383	.48307	94
Tenured	.4255	.49707	94
Targeted funding	.4574	.50086	94
Race	.7660	.42567	94
Citizenship	.8830	.32317	94
Gender	.6064	.49117	94
Administrator	.2447	.43220	94

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Academic Freedom

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.204[a]	.042	.031	.98428567	.042	3.993	1	92	.049

a. Predictors: (Constant), Tenure track

b. Dependent Variable: Research

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ANOVA[b]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	3.869	1	3.869	3.993	.049[a]
	Residual	89.131	92	.969		
	Total	93.000	93			

a. Predictors: (Constant), Tenure track

b. Dependent Variable: Research

Coefficients[a]

Model		Unstandardized Coefficients		Standard-ized Coeffi-cients			95.0% Confidence Interval for B		Collinearity Statistics	
		B	Std. Error	Beta	t	Sig.	Lower Bound	Upper Bound	Toler-ance	VIF
1	(Constant)	-.289	.177		-1.636	.105	-.640	.062		
	Tenure track	.432	.216	.204	1.998	.049	.003	.860	1.000	1.000

a. Dependent Variable: Research

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Residuals Statistics[a]

	Minimum	Maximum	Mean	Std. Deviation	N
Predicted Value	-.2892072	.1423083	.0000000	.20395864	94
Std. Predicted Value	-1.418	.698	.000	1.000	94
Standard Error of Predicted Value	.124	.177	.141	.025	94
Adjusted Predicted Value	-.3668683	.1763708	.0000000	.20508426	94
Residual	-2.11187458	2.32983184	.00000000	.97897951	94
Std. Residual	-2.146	2.367	.000	.995	94
Stud. Residual	-2.163	2.406	.000	1.005	94
Deleted Residual	-2.14593697	2.40749288	.00000000	.99915634	94
Stud. Deleted Residual	-2.208	2.472	.002	1.013	94
Mahal. Distance	.487	2.011	.989	.720	94
Cook's Distance	.000	.096	.010	.014	94
Centered Leverage Value	.005	.022	.011	.008	94

a. Dependent Variable: Research

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Table J. 5

Freedom to teach

Descriptive Statistics

	Mean	Std. Deviation	N
TEACH	.0000000	1.00000000	94
School category	.511	.5026	94
Tenure track	.7021	.45978	94
Discipline	.5319	.50166	94
Rank	.6383	.48307	94
Tenured	.4362	.49857	94
Targeted funding	.5000	.50268	94
Race	.7872	.41146	94
Citizenship	.8830	.32317	94
Gender	.6170	.48872	94
Administrator	.2447	.43220	94

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ANOVA[c]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	5.210	1	5.210	5.460	.022[a]
	Residual	87.790	92	.954		
	Total	93.000	93			
2	Regression	9.122	2	4.561	4.949	.009[b]
	Residual	83.878	91	.922		
	Total	93.000	93			

a. Predictors: (Constant), Gender

b. Predictors: (Constant), Gender, Citizenship

c. Dependent Variable: TEACH

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Academic Freedom

Model Summary[c]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.237[a]	.056	.046	.97685331	.056	5.460	1	92	.022
2	.313[b]	.098	.078	.96006876	.042	4.245	1	91	.042

a. Predictors: (Constant), Gender

b. Predictors: (Constant), Gender, Citizenship

c. Dependent Variable: Teach

Coefficients[a]

Model		Unstandard-ized Coefficients		Standard-ized Coeffi-cients			95.0% Confidence Interval for B		Collinearity Statistics	
		B	Std. Error	Beta	t	Sig.	Lower Bound	Upper Bound	Toler-ance	VIF
1	(Constant)	.299	.163		1.835	.070	-.025	.622		
	Gender	-.484	.207	-.237	-2.337	.022	-.896	-.073	1.000	1.000
2	(Constant)	.883	.325		2.712	.008	.236	1.529		
	Gender	-.519	.204	-.254	-2.539	.013	-.925	-.113	.993	1.007

a. Dependent Variable: Teach

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Residuals Statistics[a]

	Minimum	Maximum	Mean	Std. Deviation	N
Predicted Value	-.2733168	.8826153	.0000000	.31319349	94
Std. Predicted Value	-.873	2.818	.000	1.000	94
Standard Error of Predicted Value	.133	.325	.163	.053	94
Adjusted Predicted Value	-.3086376	1.0105923	-.0000654	.31523263	94
Residual	-2.29108357	2.21460772	.00000000	.94968934	94
Std. Residual	-2.386	2.307	.000	.989	94
Stud. Residual	-2.410	2.340	.000	1.006	94
Deleted Residual	-2.33596587	2.27957010	.00006541	.98252698	94
Stud. Deleted Residual	-2.477	2.401	.000	1.016	94
Mahal. Distance	.798	9.695	1.979	2.367	94
Cook's Distance	.000	.106	.012	.020	94
Centered Leverage Value	.009	.104	.021	.025	94

a. Dependent Variable: Teach

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Appendix K. Correlations for Stepwise Regression Analysis

Table K. 1

Institutional Autonomy

Correlations

		AUTONOMY	School cate-gory	Tenure track	Disci-pline	Rank	Tenured	Targeted funding	Race	Citizen-ship	Gender	Admini-strator
Pearson Correla-tion	Autonomy	1.000	.001	.024	-.003	-.002	.066	.074	.152	.077	.165	.244
	School category	.001	1.000	-.055	-.274	.025	.056	.411	-.081	-.129	.084	-.148
	Tenure track	.024	-.055	1.000	-.195	.272	.549	.083	.315	.194	.014	.210
	Discipline	-.003	-.274	-.195	1.000	.061	-.226	-.468	.019	.090	.085	.207
	Rank	-.002	.025	.272	.061	1.000	.562	-.005	.361	.285	.113	.298
	Tenured	.066	.056	.549	-.226	.562	1.000	.129	.308	.244	.036	.218
	Targeted funding	.074	.411	.083	-.468	-.005	.129	1.000	.086	-.022	-.068	-.081
	Race	.152	-.081	.315	.019	.361	.308	.086	1.000	.458	-.012	.144

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Academic Freedom

		Autonomy	School	Tenure Track	Disci-pline	Rank	Tenured	Targeted funding	Race	Citizen-ship	Gender	Admini-strator
	Citizenship	.077	-.129	.194	.090	.285	.244	-.022	.458	1.000	-.113	.208
	Gender	.165	.084	.014	.085	.113	.036	-.068	-.012	-.113	1.000	.095
	Administra-tor	.244	-.148	.210	.207	.298	.218	-.081	.144	.208	.095	1.000
Sig. (1-tailed)	Autonomy	.	.498	.407	.488	.491	.255	.231	.063	.222	.049	.007
	School	.498	.	.290	.003	.400	.287	.000	.209	.098	.201	.068
	Tenure track	.407	.290	.	.025	.003	.000	.203	.001	.026	.444	.017
	Discipline	.488	.003	.025	.	.273	.011	.000	.425	.185	.199	.019
	Rank	.491	.400	.003	.273	.	.000	.481	.000	.002	.130	.001
	Tenured	.255	.287	.000	.011	.000	.	.098	.001	.007	.360	.014
	Targeted funding	.231	.000	.203	.000	.481	.098	.	.196	.415	.247	.210
	Race	.063	.209	.001	.425	.000	.001	.196	.	.000	.453	.075
	Citizenship	.222	.098	.026	.185	.002	.007	.415	.000	.	.129	.018
	gender	.049	.201	.444	.199	.130	.360	.247	.453	.129	.	.170
	Admini-strator	.007	.068	.017	.019	.001	.014	.210	.075	.018	.170	.

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Table K. 2.

Faculty Governance

Correlations

		Faculty Governance	Targeted funding	Administrator	Citizenship	Gender	Tenured	Rank	Discipline	Race	School category	Tenure track
Pearson Correlation	Faculty Governance	1.000	.124	-.271	-.099	-.123	-.121	-.065	-.026	-.176	.010	-.113
	Targeted funding	.124	1.000	-.138	-.023	-.053	.075	-.049	-.417	.010	.439	.054
	Administrator	-.271	-.138	1.000	.201	.098	.179	.284	.238	.148	-.159	.209
	Citizenship	-.099	-.023	.201	1.000	-.104	.243	.293	.103	.448	-.128	.194
	Gender	-.123	-.053	.098	-.104	1.000	.064	.083	.098	-.019	.054	.051
	Tenured	-.121	.075	.179	.243	.064	1.000	.553	-.161	.277	.005	.554
	Rank	-.065	-.049	.284	.293	.083	.553	1.000	.130	.303	-.021	.273
	Discipline	-.026	-.417	.238	.103	.098	-.161	.130	1.000	.021	-.270	-.176
	Race	-.176	.010	.148	.448	-.019	.277	.303	.021	1.000	-.105	.341
	School category	.010	.439	-.159	-.128	.054	.005	-.021	-.270	-.105	1.000	-.079
	Tenure track	-.113	.054	.209	.194	.051	.554	.273	-.176	.341	-.079	1.000

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		Academic Freedom										
		.	.101	.002	.156	.104	.108	.252	.396	.035	.459	.124
Sig. (1-tailed)	Faculty Governance											
	Targeted funding	.101	.	.079	.406	.295	.222	.309	.000	.461	.000	.290
	Administrator	.002	.079	.	.019	.157	.032	.002	.007	.064	.051	.015
	Citizenship	.156	.406	.019	.	.144	.006	.001	.145	.000	.094	.023
	Gender	.104	.295	.157	.144	.	.255	.197	.157	.422	.290	.299
	Tenured	.108	.222	.032	.006	.255	.	.000	.048	.002	.480	.000
	Rank	.252	.309	.002	.001	.197	.000	.	.091	.001	.416	.002
	Discipline	.396	.000	.007	.145	.157	.048	.091	.	.416	.002	.035
	Race	.035	.461	.064	.000	.422	.002	.001	.416	.	.141	.000
	School category	.459	.000	.051	.094	.290	.480	.416	.002	.141	.	.208
	Tenure track	.124	.290	.015	.023	.299	.000	.002	.035	.000	.208	.

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Table K. 3

Freedom to speak

Correlations

		Speak	School category	Tenure track	Disci-pline	Rank	Tenured	Targeted funding	Race	Citizenship	Gender	Administra-tor
Pearson Correlation	Speak	1.000	.059	-.135	-.078	.009	-.138	.044	-.201	-.182	-.232	-.208
	School category	.059	1.000	.000	-.352	-.020	.086	.464	-.061	-.158	.188	-.257
	Tenure track	-.135	.000	1.000	-.210	.243	.538	.081	.291	.176	-.020	.217
	Discipline	-.078	-.352	-.210	1.000	.062	-.181	-.526	.070	.132	.133	.195
	Rank	.009	-.020	.243	.062	1.000	.569	.002	.380	.267	.172	.274
	Tenured	-.138	.086	.538	-.181	.569	1.000	.162	.308	.248	-.021	.229
	Salary	.044	.464	.081	-.526	.002	.162	1.000	.101	.013	-.068	-.154
	Race	-.201	-.061	.291	.070	.380	.308	.101	1.000	.435	-.014	.184
	Citizenship	-.182	-.158	.176	.132	.267	.248	.013	.435	1.000	-.093	.209
	Gender	-.232	.188	-.020	.133	.172	-.021	-.068	-.014	-.093	1.000	.122
	Administrator	-.208	-.257	.217	.195	.274	.229	-.154	.184	.209	.122	1.000

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Sig. (1-tailed)		.	.291	.104	.233	.468	.099	.340	.029	.044	.014	.025
	Speak											
	School category	.291	.	.498	.000	.427	.213	.000	.286	.069	.039	.008
	Tenure track	.104	.498	.	.024	.011	.000	.225	.003	.050	.427	.021
	Discipline	.233	.000	.024	.	.282	.045	.000	.256	.108	.107	.033
	Rank	.468	.427	.011	.282	.	.000	.492	.000	.006	.054	.005
	tenured	.099	.213	.000	.045	.000	.	.065	.002	.010	.423	.015
	Targeted funding	.340	.000	.225	.000	.492	.065	.	.173	.452	.262	.074
	Race	.029	.286	.003	.256	.000	.002	.173	.	.000	.448	.042
	Citizenship	.044	.069	.050	.108	.006	.010	.452	.000	.	.194	.025
	Gender	.014	.039	.427	.107	.054	.423	.262	.448	.194	.	.127
	Administrator	.025	.008	.021	.033	.005	.015	.074	.042	.025	.127	.

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Table K. 4

Freedom to research

Correlations

		Research	School category	Tenure track	Discipline	Rank	Tenured	Targeted funding	Race	Citizenship	Gender	Admini-strator
Pearson Correla-tion	Research	1.000	.132	.204	-.115	-.050	.104	.116	.131	.101	.001	.151
	School category	.132	1.000	-.053	-.301	-.028	.025	.429	-.089	-.158	.126	-.235
	Tenure track	.204	-.053	1.000	-.235	.225	.558	.099	.307	.167	.037	.189
	Discipline	-.115	-.301	-.235	1.000	.064	-.203	-.528	.047	.131	.091	.175
	Rank	-.050	-.028	.225	.064	1.000	.558	-.020	.368	.277	.164	.274
	Tenured	.104	.025	.558	-.203	.558	1.000	.160	.323	.246	.033	.211
	Salary	.116	.429	.099	-.528	-.020	.160	1.000	.104	.002	-.047	-.125
	Race	.131	-.089	.307	.047	.368	.323	.104	1.000	.424	.018	.139
	Citizenship	.101	-.158	.167	.131	.277	.246	.002	.424	1.000	-.090	.207
	Gender	.001	.126	.037	.091	.164	.033	-.047	.018	-.090	1.000	.104
	Administrator	.151	-.235	.189	.175	.274	.211	-.125	.139	.207	.104	1.000

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		Research	School category	Tenure track	Discipline	Rank	Tenured	Targeted funding	Race	Citizen-ship	Gender	Admini-strator
Sig. (1-tailed)	Research	.	.103	.024	.134	.317	.160	.133	.104	.167	.495	.073
	School category	.103	.	.306	.002	.393	.406	.000	.197	.064	.113	.011
	Tenure track	.024	.306	.	.011	.014	.000	.171	.001	.054	.362	.034
	Discipline	.134	.002	.011	.	.269	.025	.000	.326	.105	.192	.046
	Rank	.317	.393	.014	.269	.	.000	.425	.000	.003	.057	.004
	Tenured	.160	.406	.000	.025	.000	.	.062	.001	.008	.377	.021
	Salary	.133	.000	.171	.000	.425	.062	.	.159	.492	.327	.115
	Race	.104	.197	.001	.326	.000	.001	.159	.	.000	.433	.090
	Citizenship	.167	.064	.054	.105	.003	.008	.492	.000	.	.194	.023
	Gender	.495	.113	.362	.192	.057	.377	.327	.433	.194	.	.159
	Administrator	.073	.011	.034	.046	.004	.021	.115	.090	.023	.159	.

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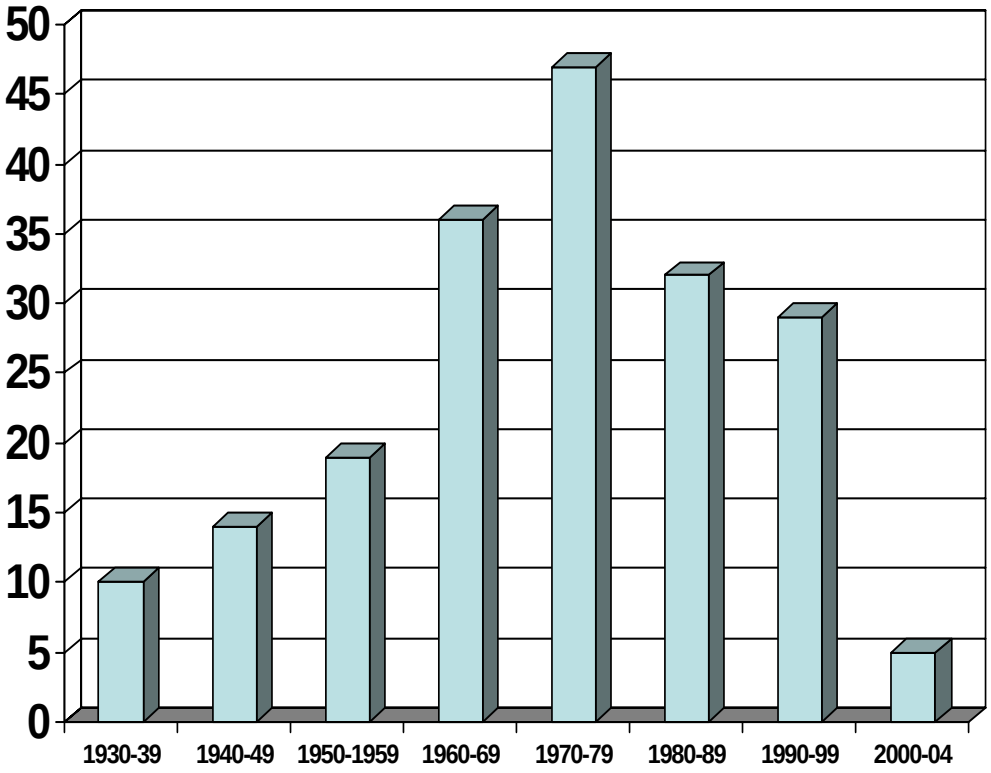
Figure 1.

AAUP Censure Rates



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Vita

Shelly Ann Elliott was born May 30, 1960, as Shelly Ann Smith to Johnny Green and Elizabeth Ann Harrison Smith of Chestertown, Md. She was raised in Dover, DE. She is a 1982 graduate of West Virginia University P.I. Reed School of Journalism. She was awarded the Master of Science in Adult and Continuing Education from Virginia Polytechnic Institute and State University in 1994. The title of her master's thesis was "The effects of lateral and vertical heterogeneity on focus group discussions assessing organizational and learning needs." While at Virginia Tech, she was recipient of a merit-based instructional fee scholarship from the faculty.

She currently is staff development consultant for the Virginia Department of Social Services' Division of Licensing Programs, where she has responsibility for the professional development and training of licensing inspectors of Virginia's child and adult care industries. Previously, she was assistant professor for eight years at Virginia Commonwealth University School of Medicine in support of the Virginia Generalist Physician Initiative, serving for four of those years in the capacity of associate director of the Virginia Statewide Center for the Advancement of Generalist Medicine. She also has served as editor of Factor Learning Design Inc., a women-owned adult education consulting firm in northern Virginia, and has worked in the field of medical education at the Department of Psychiatry for the Uniformed Services University of the Health Sciences. She has several publications. She is married to David T. Elliott and has three children, Garland Hurst Moore IV, 21; Eliza Hollister Moore, 18 (an art student at Virginia Commonwealth University); and Abigail Christian Elliott, 6.

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