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Exploring Postsecondary Market and Discipline Influences on Faculty Role Performance

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EXPLORING POSTSECONDARY MARKET AND DISCIPLINE INFLUENCES ON FACULTY ROLE PERFORMANCE

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Abstract

Exploring Postsecondary Market and Discipline Influences on Faculty Role Performance

Prior research has shown that the type of institution, disciplines, and characteristics of the faculty influence the structure and character of academic work. Zemsky and Shaman (1997) and others have suggested that differentiation among institutions, which has historically been structured along level of degree offerings and size/complexity, is now becoming increasingly structured along the lines of market segments – with many non-selective four-year institutions increasingly resembling two-year "convenience" institutions in terms of their academic organization. The purpose of this study was to test the extent to which academic work is increasingly organized by institutional market segment rather than traditional categories of institutional types and whether the shaping influences of discipline, gender, and type of appointment persist within these newly-defined institutional market segment categories. A comparison of the triumvirate of faculty work at the institutional market segments was done using data from the Changing Academic Profession (CAP) Survey 2007-2008. The results of the multivariate analysis of variance determined that some of the measures of faculty work in teaching, research, and service are affected by institutional type (Carnegie Basic Classification), market segment, discipline, gender, and appointment type.

KEYWORDS: market segment, faculty work, institution, discipline

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Dedication

To my family and friends,

you have inspired me to achieve and not merely exist.

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Chapter 1

Introduction to Study

Background

Since World War II, the industry of postsecondary education in the United States has grown in demand. Initially, the growth was the increase of institutions and their infrastructures to meet the opportunity of the growing student body, as well as the supply of financial resources from tuition and government support of postsecondary education. In 1972, federal legislation moved student aid to a new form of Pell Grants made directly to students for portability and for forming a competitive postsecondary education market. Institutions became even more concerned with prestige and rankings as these were the key to attracting students to their doors. Newman and Couturier described a competitive environment for higher education “in which institutions engage in a frantic and never-ending search for better students, better faculty, winning athletic teams, more research funding, prestige, and the revenue to make these things possible" (Newman & Couturier, 2001).

Bok (2003) furthered this idea of universities in the marketplace by describing the commercialization of higher education as efforts by institutions to make a profit from teaching, research, and other campus activities. Bok suggests that the effects of commercialization have impacted shifts in programs to vocational or job oriented training, undermining collegiality and trust within academic communities and creating a climate where faculty may be more interested in commercial ventures. He quotes Zusman (1999) to emphasize faculty behavior: "faculty members not only are teaching less but have become less willing to serve on institutional committees, less willing to protect the

institution from political disruption, and less careful to avoid exploiting the institution's name or facilities for economic gain." (pp 109).

Given the new marketplace, Zemsky and colleagues asked themselves whether the traditional typologies of colleges and universities based on degrees offered and research funding were still adequate to describe institutional behavior in the new environment (Gumport, 1997; Zemsky et al.,1998, 2001, 2005) Zemsky and his colleagues focused their research on postsecondary markets and student outcomes to create a taxonomy for institutions that incorporated the interaction among undergraduate degree awarded, full-time/part-time student, and student demand. Zemsky and his team classified institutions by market segments using the percent of a freshman class graduating within five years, stratified by the demand for the institution (Zemsky, et al., 2001). The resulting classification divided postsecondary institutions into three market segments: name-brand, core, and convenience. The qualities of the three market segments can be quickly described by level of admissions competitiveness and undergraduate graduation rates: name-brand segment have the highest in both competitiveness and graduation rates, core segment are moderate, and the convenience segment is the lowest. Zemsky and his team further stated “that the successful college or university needs to be both market smart and mission centered. To meet today's challenges, institutional leaders and researchers must first understand the structure and then develop the analytic wherewithal for determining their institution's place in the market" (Zemsky et al., 2001, jacket).

The overall mission of higher education includes the cultivation of the next generation of leaders in their respective areas and the advancement of knowledge in the

disciplines by supporting faculty research initiatives. In addition, service to the community at the local, national and professional levels are included, in some form, for most higher education institutions. These three overarching goals of the institution – teaching, research, and service - define three facets of the faculty role within academe.

Faculty role performance in each of these three area, as measured by time allocation and productivity, is also influenced by various factors. Clark (1987) stated that their discipline (small world) and their institution (different world) differentiate the pattern of faculty work. In a study of two-year institutions, Palmer validated Clark's premise that the institution and discipline affect how full-time faculty enact their roles. (Palmer 2000, 2002). Previous research has also found that gender has a significant influence on faculty work (Clark, 1987; Blackburn & Lawrence, 1995; Schuster & Finkelstein, 2006; Gappa, Austin & Trice, 2007; Cummings & Finkelstein, 2012).

Cummings and Finkelstein further expanded on the determinants of faculty work in their study of the changing academic profession to include type of appointment (Cummings & Finkelstein, 2012).

Previous research on the interaction between faculty work and institutional context has focused on using the tradition of topography delineated by the Carnegie Classification. This framework divides four-year and two-year institutions based on level of degrees offered, federal research funding, curricular specialization, undergraduate admission selectivity, and preparation of future PhD. As a result, research on faculty work has been either in four year or two year institutions separately, furthering the cultural differences that exist between the prestigious research universities and the less prestigious community colleges (Clark's different worlds). There is no doubt that the

focus of doctoral/research universities would be quite different from community colleges or even liberal arts colleges. However, what of the similarities of the roles that faculty play within the context of undergraduate education focused institutions? The Carnegie Classification would divide the liberal arts colleges from the two-year community colleges, while their missions toward undergraduate education would be quite similar.

With the marketization of higher education over the past quarter century, all of the institutions are competing with each other for students (Bok, 2003; Slaughter and Rhoades, 2004; Gumport, 1997; Zemsky, et al., 1998, 2001, 2005). Thus, institutions make decisions on how be more prestigious or more attractive to students; therefore, institutions would modify their policies about faculty work and whom to hire. For example, the increased use of full-time non-tenure track faculty (FTNTT) by research universities has allowed for an increase of research productivity while providing the teaching faculty to serve the ever-growing student population, which, in turn, provides more tuition dollars to the university and increases the prestige of the university. In addition, four-year institutions focused almost exclusively on teaching would also increase the use of staffing with non-tenure track faculty to meet the needs for teaching an increasing group of undergraduates while offering lower, flexible costs to the university.

It is also noteworthy that the increase of full-time non-tenure track (FTNTT) faculty being employed by four-year institutions changes the composition of academe and the balance of teaching versus research for much of the faculty (Cumming & Finkelstein, 2012; Kezar, 2012). Since FTNTT faculty are hired primarily for teaching, the faculty work of this group may be like that at both four-year and two-year institutions.

Since their market segment as determined by the clients (students) that they serve influences their institutional decisions, it would be a logical assumption that academic work would also be shaped by the institutional market segment in which faculty are working. Therefore, the differentiation of their academic work can be evaluated with respect to their market segment. The market segment classification could also be extended to the perspective of the discipline of the faculty, as there would be consistency between their work across the spectrum of market segments. For example, the academic work for an English faculty member at a four-year liberal arts college within the convenience market segment would be like that of a colleague at a two-year community college.

Understanding the impact of these factors on the role of faculty in supporting the overall mission of higher education would provide a more nuanced view that considers the increasing consumer orientation of postsecondary institutions. Therefore, the purpose of this study is to explore the determinants—institutional type, market segment, discipline, gender, and appointment type—of faculty work across four and two year institutions because of the "commercialization" or "marketization" of higher education.

Conceptual Underpinnings for the Study

Before expanding on the theoretical framework to be used for this exploration of faculty work within the context of individual and environmental factors, faculty work and the classification of institutions and disciplines each need to be defined.

Faculty work. The role of faculty is to be an expert in their discipline who is responsible for teaching their students, and a researcher or scholar of their discipline, while also providing services to their community (department, institution, and

discipline-related associations). The American Association of University Professors (AAUP) offered the following statement on faculty work in their report, "The work of faculty: Expectations, Priorities, and Rewards:" "Faculty workload combines teaching, scholarship, and service; this unity of components is meant to represent the seamless garment of academic life, and it defines the typical scholarly performance and career" (AAUP, 1993, p. 196).

For the purposes of this study, the primary definition of teaching is: "Teaching is the activity that organizes and facilitates the activities that causes learning. Learning is the acquisition and retention of knowledge and habits of thought in a way that permits them to be employed in a useful way after the initial exposure has been determined" (Dilts, et.al., 1994, p. 48). Therefore, teaching activities would be related directly to instructional purposes, such as hours spent lecturing, preparation, and grading as well as interaction with students, such as advisement. They would also include the implementation of pedagogical practices, faculty attitudes about students, and teaching practices. This study focused on the self-reported activities related to teaching activities and working with students and hours spent per week on teaching-related activities.

The research aspect of faculty work has evolved from the traditional view of research, which is defined as the creation or discovery of new knowledge and the dissemination of that knowledge, including the application and integration of knowledge as well as scholarly activities related to pedagogy in their discipline (Boyer, 1997). To assess the faculty work of research and scholarship, faculty reports of hours of research along with publications, including journals and books, collaborative

research, presentations and/or attendance at disciplinary conferences, grant writing, and attitudes towards research were used in this study.

The third aspect of faculty work is service. While it is often a criterion for evaluation of faculty work, its definition and measurement is not as clear-cut as teaching and research. The following proposes a possible framework to assess the service activities of faculty: "the activity produces social benefit which exceeds the individual's (private) compensation should it count as service" (Dilts, et.al, 1994, pg. 82). This would include service to the institution, the department, and their discipline, such as serving on committees. Citizenship may also be included in the service activities of faculty work. Citizenship is service to the community outside of the workplace; it includes, for example, volunteer work at a soup kitchen or being a scout leader. The measures for faculty role in performance of service will be hours spent per week on service-related activities and indication of specific service activities.

Classification. Before delving into institutional and discipline types to be used for this study, it is worthwhile to take a moment to discuss the general theory behind classification. "Organizational classification provides the basis for strong research by breaking the continuous world of organizations into discrete and collective categories well suited for detailed analysis" (Rich, 1992, p. 758). The challenge for a successful classification is providing a clear definition of the fundamental or defining characteristic of the phenomenon be identified. A further challenge for classification is that if there is more than one characteristic to be used in the system, this determines how well the group will be divided into exhaustive and mutually exclusive classes (Marradi, 1990). Classification schemes also reflect the knowledge or focus of the domain being classified

(Kwasnik, 1999). Therefore, institutional and disciplinary classifications need to be in alignment with their critical characteristics, which are relevant to the studies utilizing them.

Carnegie Classification. The Carnegie Classification was developed in 1971 to categorize the U.S. post-secondary institutions such that the categories will be "relatively homogeneous with respect to the functions of the institutions as well as with respect to characteristics of students and faculty members" (Kerr in McCormick & Zhao, 2005). The classification system has since gone through at least four updates in response to the changing characteristics of institutions as well as the changing priorities of research. The defining characteristics for the Carnegie Classification are type of degrees awarded, location, level of research activity, federal research dollars, program size, and major field of study. The most commonly used classification in the research of faculty is the six all-inclusive classification (Basic Classification): Associate's Colleges, Doctorate-granting Universities, Master's Colleges and Universities, Baccalaureate Colleges, Special Focus Institutions, and Tribal Colleges. Many researchers will also break apart the Doctorate-granting Universities into two categories—Doctoral and Research—to distinguish the institutions with a limited number of doctoral programs in a few fields or limited federal research funding from the institutions with extensive doctoral programs, professional schools (including law and medicine), and various research centers having large federal research funding. In the 2010 version of the Carnegie Classification, there are several schema (logic) presented that allow researchers to focus on different characteristics to classify the institutions. For example, there is a schema for Undergraduate Instructional Program that initially divides all institutions with undergraduate programs into Associate

only, Associate dominant, and Baccalaureate dominant. There is also a schema for Undergraduate Profile, which focuses on dividing two-year and four-year institutions by the percentage of their part-time students. The four-year institutions are further broken down by their selectivity and percentage of transfers. Yet, the entire classification schema perpetuates the separation of two-year and four-year institutions.

Market Segment. Motivated by the idea that the academic culture of liberal arts colleges and community colleges would be similar in their view of small environments to foster student learning, this study incorporated the classification system proposed by the National Center for Postsecondary Improvement (NCPI), which maps the institutions to their market sectors (Gumport, 1997). The scale was developed from four sets of information: admit and yield rates, percentage of freshmen who graduate with a BA or BA in five years, percentage of undergraduate enrollment that is part-time, and ratio of number of BA/BS degrees awarded to total undergraduate enrollment. The market is divided into three general categories: name brand, core, and convenience/user friendly.

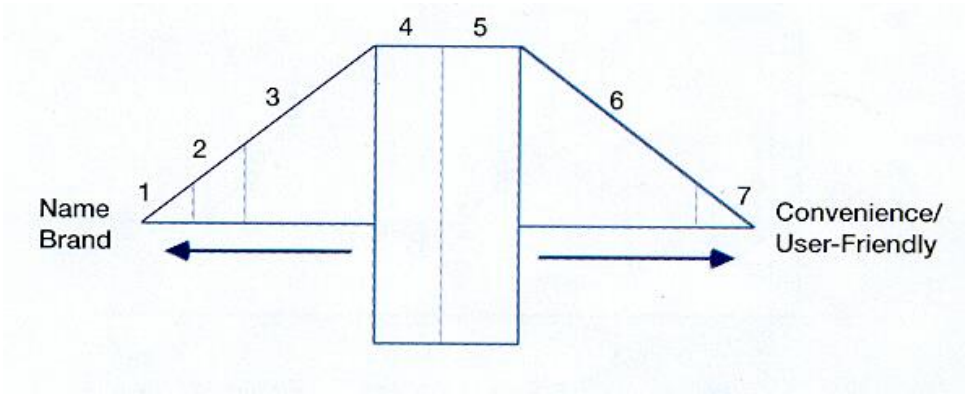

Figure 1.1: Market segments (Gumport, 1997)

An examination of the postsecondary market chart (Figure 1.1) reveals a continuum: At one side is Name Brand, and the opposing side is Convenience/User-Friendly. The center represents the core market segment, either leaning toward name brand or convenience/user friendly. The name brand market segment is the classic baccalaureate educational institution leading to graduate or professional education. Segments 1 to 3 range from highly selective, very competitive institutions such as the Ivy Leagues and elite colleges to selective colleges and universities that graduate most of their students within five years. The core market segments, segments 4 and 5, tend to either have name brand experiences or have more part-time students, similar to the composition of the convenience/user friendly segment. These institutions tend to serve local or metropolitan markets. Segments 6 and 7 are the convenience/user friendly market segments, which serve increasingly more part-time students and have lower completion rates for BA/BS degrees. These include the technical colleges, community colleges, distance learning institutions, and for-profit institutions.

Since the convenience/user friendly segment of the market is determined largely due to the award of BS/BA degrees, as well as by its part-time students, the question is raised whether there may be an even better way of segmenting this market such that two-year institutions would be classified similarly to four-year institutions in the same market segment. The answer lies in the focus of the programs within the institution. The institution can be distinguished by looking at the extent to which it focuses on providing degrees and certificates as compared to providing a broad range of courses to students. The result is that two-year institutions can be classified into three market segments (8, 9, and 10): degree oriented, mixed, and course (Zemsky, et. al., 1998). Therefore, if we

consider using the market segments 1–8, we would have a way to compare faculty across four- and two-year institutions whose mission includes the education of undergraduate students toward attaining either a baccalaureate or associate's degree.

Discipline. There are two classification systems for the disciplines that prior research about faculty work have used: Biglan's classification (Biglan, 1973) and Holland's Academic Environments (Holland, 1997). Biglan's classification uses three-dimensional pairs to classify the disciplines: hard/soft, pure/applied, and life/non-life. Holland's Academic Environments is based Holland's person-environment fit theory, which classifies six types (Realistic, Investigative, Artistic, Social, Enterprising, and Conventional) based on patterns of attitudes, interests, and abilities analogous to personality types (Smart and Umbach, 2007). Disciplines classified using Holland's theory would have a primary/dominant and a secondary type.

This study utilizes a modification of Biglan's classification, which is the fourfold classification proposed by Becher and Trowler (2001) and used by Clark (1987) and others to explore the impact of the disciplines on faculty work. They proposed a taxonomy that meshes disciplinary groupings with the culture or general nature for the groups. Their system of classification is based on the dimensions of soft vs. hard, and pure vs. applied, and it focuses on the nature of the knowledge that is shared within the disciplinary grouping.

Theoretical Framework

Clark (1987) used the metaphor "small world, different world" to describe the differentiation of academic life by discipline (small world) and institution (different

world). This two-dimensional framework offers a way to understand academic life in the context of the environmental influences that, in the past, have been characterized by Carnegie's classification for postsecondary institutions and Biglan's classification of disciplines. Clark's framework is supported by Blackburn and Lawrence's (Blackburn et al., 1991; Blackburn & Lawrence, 1995) work on predicting faculty role performance and achievement in teaching, research, and service grounded in motivational theory. Blackburn and Lawrence proposed a theoretical framework to explain how individual characteristics and environmental factors influence faculty role performance as measured by their behaviors and products. The model divides their individual characteristics among the socio-demographic characteristics of career, self-knowledge, and social knowledge. Their model's socio-demographic characteristics include age, racial/ethnicity, and gender. Its career characteristics include discipline, types of positions, career age (the number of years in a full-time faculty appointment), and prior accomplishments, such as publications, awards, grants, and fellowships. The self-knowledge construct focuses on one's understanding of self, such as self-image, self-assessed competence, self-efficacy, and personal attitudes and values with respect to faculty role and disposition (ambition, persistence, and supportiveness). The social knowledge construct focuses on how the individual perceives their environment, its expectations and incentive structure, and its subjective norms.

The environmental factors in their model are environmental conditions, environmental response, and social contingencies. The environmental conditions include institutional type, fiscal condition of the institution, location, composition of the department, and composition of the student body. The environmental response is formal

feedback about role performance, such as awarding tenure or grants. The social contingencies are factors of personal life, such as having children and other outside factors, which affect the person's life.

The outcomes predicted by these individual and environmental factors are faculty behavior and products. Blackburn and Lawrence, like many researchers in faculty work, focused on each member of the triumvirate of faculty work separately. For research, Blackburn and Lawrence used number of publications and conference presentations as products of research and percent of time given to research behavior. In their study of teaching, they focused on faculty behavior toward teaching such as preparing undergraduates as scholars and percentage of time given to teaching activities. Service outcomes were also focused on behaviors, defined as the percent of time given to three kinds of service activities: public (dealing with the nonacademic world), professional (working with disciplinary associations), and campus (serving on committees).

Statement of the Problem

Previous research has shown that the structure and character of academic work is influenced by type of institution, the disciplines, gender, and appointment type. Zemsky and Shaman (1997) and others have suggested that differentiation among institutions, which historically has been structured along level of degree offerings and size/complexity, is now increasingly becoming structured along the lines of market segments, with many non-selective four-year institutions resembling two-year "convenience" institutions in terms of their academic organization. The purpose of this study is to test the extent to which academic work is influenced by market segments compared to the Carnegie Classification institutional types and whether the influences of

discipline, gender, and type of appointment persist within these market segments. A comparison of the triumvirate of faculty work at institutional market segments was done using the 2007-2008 data from the Changing Academic Profession (CAP) survey.

Purpose and Research Questions

This study sought to identify the relative shaping role of the traditional arbiters of academic work, traditional institutional type, and academic field, with the emerging shaping factors identified earlier: institutional market segments, type of appointment, and gender. For this study, academic work was measured by time allocation, activities, total scholarly contributions, and publications and presentations that the faculty reported for teaching, research, and service in the CAP 2007 Survey.

RQ1: To what extent do market segments affect faculty work patterns compared to the Carnegie Classification institutional type effect?

RQ2: How does institutional type (Carnegie or market segment) interact with discipline in affecting faculty work patterns?

RQ3: How does gender interact with institutional type (Carnegie or market segment) or discipline in affecting faculty work patterns?

RQ4: How does appointment type influence faculty work in the context of institutional type (Carnegie or market segment) and discipline?

Significance of Project

This study sought to add to the research on faculty work and the influences on it with empirical research using data from the 2007-2008 CAP Survey. Past research on the

influences on faculty work have focused on Carnegie-classified institutions, discipline, and characteristics of the individuals, such as gender and appointment type. The research looking at the effects of marketization or commercialization of higher education has used the Carnegie Classification when describing the effects of institutional policies on faculty (Bok, 2003; Slaughter and Rhoades, 2004; Slaughter and Leslie, 1997). This study provided a lens for understanding faculty work by focusing on the effects of marketization of higher education on faculty work by exploring whether market segment may provide a better classification of higher education institutional type.

Zemsky and his research team at National Center for Postsecondary Improvement (NCPI) suggested that the policies of institutions may be better represented using their market segments rather than using the Carnegie Classification since it captures the key characteristics of the students that are served by the institution and the mission of educating those students (Zemsky, et. al., 1998). Zemsky et al.'s insights have focused on issues pertaining to institutional policies as they affect the students directly, such as tuition and student outcomes such as degree attainment (Zemsky et al., 2001). What is missing from the research using market segments is how these segments affect faculty work. Further study of market segment on faculty work could shed light on the implications of institutional strategy on staffing and what kind of faculty is necessary to achieve the goals of the institution. For example, this study sought to demonstrate that the faculty work in two-year and four-year institutions may not be as differentiated as previously shown with the use of institutions classified by the Carnegie Basic Classification.

In addition, this study employed a multivariate analysis of variance to look at a combination of measures of faculty work in each of the areas of teaching, research, and service. The premise is that faculty work is a combination of time, activities, and products rather than just a single measurement (Colbeck, 2002). A similar approach was taken by Bland et al., (2006) in their study of the impact of appointment type on the productivity and commitment of full-time faculty in the Research and Doctoral institutions where they conducted a multivariate analysis of variance using multiple measures of research and teaching productivity and commitment as dependent variables.

Summary

Clark's "small world, different world" lens has provided a two-dimensional framework to study the effects of institution and discipline on faculty and their work. Adding the theoretical framework of Blackburn and Lawrence's model for predicting faculty role performance, there is a clear rationale for the influence of individual characteristics—gender and appointment type—and environmental characteristics—institution and discipline—on faculty work. Past research on these influences has used the Carnegie Classification to differentiate institutions, but this does not capture the increasing nature of higher education as a marketplace. Zemsky and Shaman (1997) and others have suggested that differentiation among institutions is more likely to be structured along the lines of market segments. This study was conducted to test the extent to which academic work is influenced by institutional market segment versus traditional categories of institutional types and whether the influences of discipline, type of appointment, and gender persist within these institutional market segment categories. The study used the 2007-2008 data from the CAP survey and a multivariate analysis of

variance to further explore the integrated nature of faculty work within teaching, research, and service.

Chapter 2

Review of Related Literature

Introduction

The purpose of this study is to investigate four primary influences on faculty work: institution, discipline, gender, and appointment type. This chapter will review some of the research and literature of the past 20 years since Clark's research on academic life in 1995 in which he demonstrated that the characteristics of academic life may be differentiated by small world (discipline) and different world (institution) categories. The topics to be reviewed are what defines faculty work and the ways that faculty work has been measured, the frameworks that have been suggested to describe faculty work and the influences on it, and the research on how institutions, market, discipline, gender, and appointment type affect faculty work.

Faculty Work and How It Is Measured

Most research regarding faculty work emphasizes a balance of the triumvirate of teaching, research, and service. Teaching can be simply defined as any activity related to learning (Dilts, et.al., 1994, pg. 48). Research on teaching activities tends to focus on activities related directly to instructional purposes, such as hours spent lecturing, preparation, and grading, as well as interaction with students, such as advisement. It also includes the implementation of pedagogical practices, faculty attitudes about students, and teaching practices. The research aspect of faculty work has evolved from

the traditional view of research defined as the creation or discovery of new knowledge and the dissemination of that knowledge to also include application and integration of knowledge as well as scholarly activities related to discipline-specific pedagogy (Boyer, 1990). The third aspect of faculty work is service. While service is often a criterion for the evaluation of faculty work, its definition and measurement is not as clear as that of teaching and research. The following proposes a possible framework to assess service activities of faculty: "the activity produces social benefit which exceeds the individual's (private) compensation" (Dilts, et.al, 1994, pg. 82). While there is a general agreement that faculty work is a combination of teaching, research, and service, there are several ways that faculty work has been measured and assessed.

In a 1993 report focusing on the work of faculty, the American Association of University Professors (AAUP) made a series of commendations and statements related to faculty workload and how it should be defined or measured. For example, "Faculty workload and hours in the classroom are not the same thing" (AAUP, 1993, pp. 198). They suggested that workload should be considered a total of professional effort and include the time and effort towards class preparation, grading student work, review and development of curriculum and program, scholarship, participation in governance activities, and community service, both on and off campus. AAUP also made a statement about what defines research to include scholarship:

> Research, generally understood to mean discovery and publication, should be related to a broader concept of scholarship that embraces the variety of intellectual activities and the totality of scholarly accomplishments. Though discovery and publication are the core of scholarly endeavor, scholarship seen in its many forms offers a wider context within which to weight individual contributions. (AAUP, 1993, pp. 199)

Studies on faculty workload focus on the time spent by faculty to complete their appropriate duties. Three measures are usually used to assess faculty workload. First is the total number of hours worked per week. The second is the number of hours per week spent on teaching or instruction-related activities. The third is the number of hours per week spent on research and scholarly activities (Meyer, 1998). Other research on faculty work has used time per week or percentage of time spent per week as measures of effort toward teaching, research, or service (Blackburn and Lawrence, 1991, 1995; Clark, 1995; Cummings and Finkelstein, 2012; Schuster and Finkelstein, 2006; Townsend and Rosser, 2009). The number of hours per week or percent of time devoted toward activities alone will not give a valid measure of what faculty can do since someone can work long hours and be unproductive as well as working a short time and be very productive (Meyer, 1998). Therefore, faculty role performance can also be measured with productivity.

Faculty productivity usually refers to research productivity and is measured by number of publications or scholarly contributions. For example, Blackburn and Lawrence (Blackburn et al., 1991; Blackburn & Lawrence, 1995) used a seven-item scale for faculty research products in the past two years that included the following: submission of an article for publication in an academic or professional journal; published chapters in a book; submitted a research proposal to a governmental or private agency; written a research report for an agency, institution, or other group; scholarly articles published; external grant proposal submitted; and professional writings published or accepted for publication.

Boyer (1990) introduced the idea of expanding the definition of scholarship to capture some of the scholarly activities that the professoriate engages in beyond the typical idea of research or the scholarship of discovery. Boyer's model of scholarship defines four domains: scholarship of discovery, scholarship of application, scholarship of integration, and scholarship of teaching. Scholarship of discovery is the traditional idea of research that includes creation or discovery of new knowledge, publication in peer-reviewed journal and books, and presentations at disciplinary conferences. Scholarship of application refers to the scholar's use of their disciplinary knowledge to solve problems and communicate with people outside of their disciplinary expertise. Scholarship of integration happens when the scholar connects their disciplinary expertise with other disciplines. This includes interdisciplinary work and products such as policy papers, reflective essays, and textbooks. The fourth domain of scholarship is the scholarship of teaching. Scholarly teaching activity focuses on assessment and research on teaching practices. The question, then, is how one integrates this idea of scholarship within the standard triumvirate of faculty work. One possible answer may be found in research on assessing faculty work.

Adams (2003) proposed an empirical measure for the assessment of academic accomplishment that was based on quantifiable items such as publications and teaching evaluations. He created the Academic Assessment Index (AAI) using the responses of 109 administrators from research, doctoral, and comprehensive universities to provide a method for assessing faculty performance for tenure or promotion in three areas of professional achievement: "quality of teaching, the quantity and quality of research (or other scholarly products), and the nature and significance of service" (Adams, 2003, p.

241). Based on the rankings of the administrators, the evidence for advancement was ranked as follows: books that advance knowledge in candidate's field, refereed articles or reports in print media, extramural grants or contracts, teaching awards or nominations, favorable written student teaching evaluations, presented papers at conventions, refereed article or reports in online media, favorable evaluations of student advising, developed and managed an online course in discipline, participation on major committees, and recognition for significant service to the community. Adams further developed an index from these rankings to give each of the 11 criteria a score ranging from 100 for publishing a book to 0 for recognition for community service. The creation of an index to assess faculty work as a combination of teaching, research, scholarship, and service provides us with a key point: faculty engage in tasks that combine two or more domains.

Colbeck (2002) observed English and Physics faculty at two different universities who were engaged in integrated work activities (teaching and research, teaching and service, research and service). Colbeck reported that the faculty engaged in integrated work activities, on average, 32% of their time, regardless of discipline and institutional type. Time allocation for teaching only was reported as 38.2%, research only averaged 15.7%, and other activities, such as service only, personal time only, interview time only, accounted for the remaining 14.1% (Colbeck, 2002, pp 47). Therefore, Colbeck's research showed that faculty are integrated in their work roles. Colbeck stated, "Systematic and widespread evaluation of faculty work as an integrated whole is needed to determine how much the process of faculty work is actually integrated across all types of institutions and discipline and to understand the conditions under which such joint production enhances the quality of faculty work products" (Colbeck, 2002, pp 48).

Another perspective on the measurement of faculty work is the use of multivariate analysis of variance to combine several measures of academic activities to measure faculty productivity. Bland et al. (2006) conducted a multivariate analysis of variance using various measures of research and teaching productivity. Their measure for research productivity included the following: number of juried and non-juried media (career, recent solo, and recent joint), including textbooks, patents, software products, or published review of books; any funded research; number of grants; total funds; and hours spent on research. Their measures for productivity in education (teaching and service) included the number of classes taught, number of students in non-credit courses, number of credit courses taught, hours spent on individual student instruction, hours spent teaching each week, hours spent advising advisees, number of committee served on, number of committees chaired, and average hours on committees (Bland et al., 2006, pp 103).

In summary, when describing faculty work, past research supports the triumvirate of teaching, research/scholarship, and service. Measurement of faculty work can be described in two ways: process/behavior and product. To measure process/behavior, researchers use time devoted to each domain. For measuring the aspect of product, the focus has been on number of publications and scholarly contributions. While time and products are discrete items to measure, the domains of faculty work are not mutually exclusive; therefore, faculty work could be measured as a combination of teaching, research/scholarship, and service.

Frameworks for Exploring the Factors Affecting Faculty Work

The proportions of teaching, research/scholarship, and service activities in which

faculty engage are influenced by several factors. This section will focus on frameworks that have been used to describe the factors that influence faculty work.

In 1987, Clark published a report on academic life using the Carnegie Survey. He proposed the metaphor of "small worlds, different worlds" to express the differentiation of academic life by discipline and institution. Clark showed, through the results of his survey along with interviews with faculty from six fields and six institutional types, that the institutional setting will define the expectations of the balance of teaching and research, whereas the discipline will define the specific characteristics of teaching and research.

Becher and Trowler (2001) focused on a cultural approach to the factors that affect academic life and faculty work. Their premise was based on the culture of disciplines and the disciplinary definition of knowledge. They first divided the disciplines using a modified Biglan's classification—hard/soft and pure/applied—to create disciplinary groupings that had similar values for knowledge. For example, mathematics would be an example of a hard/pure discipline since mathematics is grounded in the scientific method and tends to value theoretical knowledge rather than applied knowledge.

Another model of the factors that influence faculty work was proposed by Diamond and Adam (1995), who suggested that faculty work is affected by institutional priorities, disciplinary/professional values, personal priorities and interests, available time and resources, and appointment criteria (Figure 2.1).

Blackburn and Lawrence (Blackburn et al., 1991; Blackburn & Lawrence, 1995) developed a theoretical framework grounded in cognitive motivational theory to predict

faculty role performance and achievement. Figure 2.2 displays the theoretical framework for the predictive model.

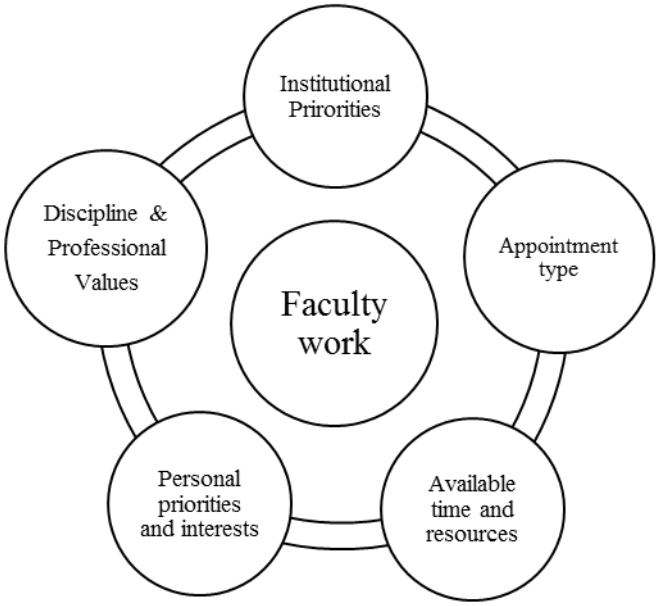

Figure 2.1 Influences on faculty work (adapted from Diamond and Adam, p 7, 1995)

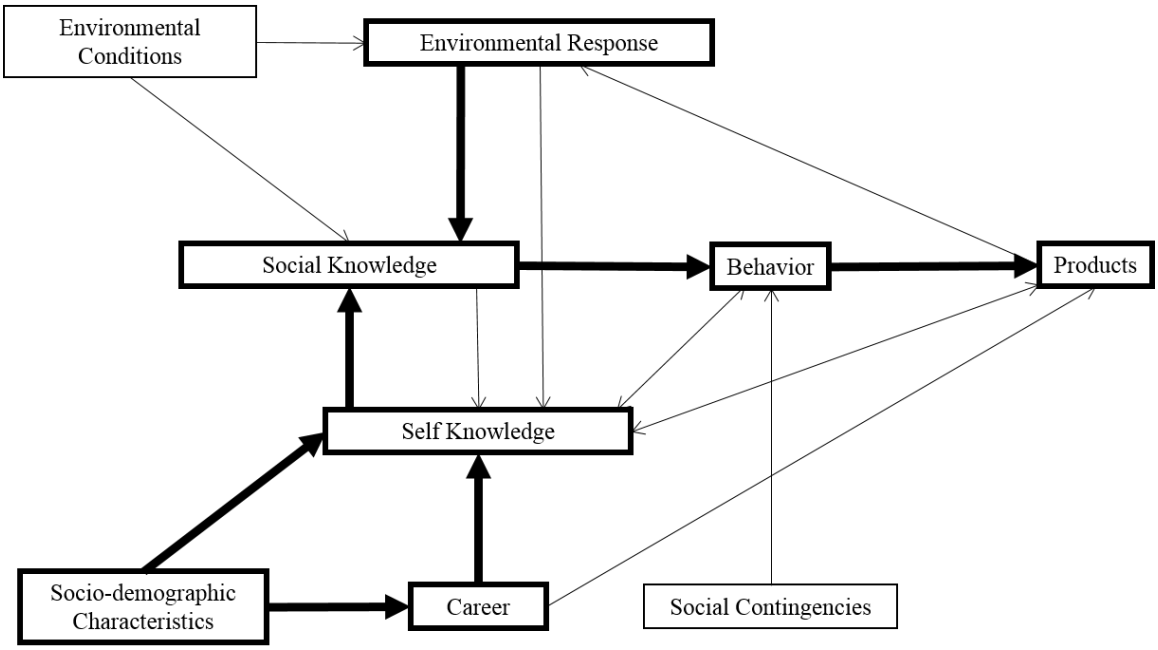

Figure 2.2 Theoretical framework for faculty role performance and achievement (Blackburn & Lawrence, 1995, pp. 27)

The four constructs of individual characteristics used for the model are socio-demographic characteristics, career, self-knowledge, and social knowledge. The socio-demographic characteristics include age, racial/ethnicity, and gender. Career characteristics include discipline, types of positions, career age (the number of years in a full-time faculty appointment), and prior accomplishments, such as publications, awards, grant, and fellowships. The self-knowledge construct focuses on one's understanding of self, such as self-image, self-assessed competence, self-efficacy, and personal attitudes and values with respect to faculty role and disposition (ambition, persistence, and supportiveness). The social knowledge construct focuses on how the individual perceives the environment, expectations of it, and incentive structures, along with their subjective norms.

The three environmental constructs for the model are environmental conditions, environmental responses, and social contingencies. Environmental conditions are the structural and normative features of the institution. Structural features of the institution include fiscal well-being, geographical location, composition of the department, system of faculty governance, composition of the student body, and quality of instructional resources. A normative feature of the institution is the shared understanding of its mission. The construct of environmental response refers to formal feedback about role performance; for example, whether faculty have been promoted, received tenure, or been awarded a grant. Social contingencies are the factors of personal life, such as having children and other outside factors that affect the person's life.

The placement of the individual and environmental construct in the theoretical framework is grounded in previous research on the factors that affect faculty and motivational research. Starting at the basic description of the individual—socio-demographic characteristics—Holland's personality theory supports the probability that career and self-knowledge would be directly affected by age, gender, and ethnicity. Furthermore, self-knowledge would also be affected by career experience. For example, decisions or perceptions of what kind of work is expected by a professor will be modeled after what one experienced through undergraduate and graduate school and colored by the discipline that the individual chooses.

The placement of self-knowledge, in the theoretical model, as primarily affecting social knowledge follows the results of cognitive motivation research. In most studies, the individual's self-knowledge predicts how they perceive their environment (social knowledge) more often than social perception predicts self-perception (Blackburn &

Lawrence, 1995). Drawing from Holland's Academic Environment and Clark's premise of "small world, different world," social knowledge would be mediated by such environmental conditions as institutional type and directly affected by environmental responses such as institutional policies and practices (Smart & Umbach, 2007; Clark, 1987). Shaped by social knowledge are the behaviors, and the products, of faculty role performance and achievement. The additional influence of social contingencies (family, outside obligations) will also affect faculty behavior and products beyond the environmental and individual constructs. The model includes the natural flow of information and feedback from behaviors, products, and environmental responses that the individual will use to adjust their self-perceptions. Also, adjustments to career is made based on receiving the grants or awards that are the products of faculty work.

The outputs of faculty role performance and achievement are either behaviors or products with respect to the three main areas of faculty work: teaching, research, and service. In the context of teaching, desired measured behaviors include preparing undergraduates as scholars and high percentage of time given to teaching. Teaching products include new course creation, publishing curricular materials, and wining teaching awards. For research, measurable behaviors include percentage of time and preference given to research. Research products are the number of publications, conference presentations, and research grants awarded. Faculty service is measured by service activities in three areas: public (community volunteerism and outside service), professional (working within a professional association), and campus (i.e., campus committee, administration of a program).

A more recent framework to describe the influences and determinants for faculty

work was proposed by Gappa et al. (2007), who focused on a set of essential elements of faculty work based on the reciprocal relationship between faculty and their institutions. Their premise was that all faculty should experience five essential elements of faculty work built on the following core requirement of respect: employment equity, academic freedom and autonomy, flexibility, professional growth, and collegiality. The two influences and determinants are faculty characteristics and institutional characteristics. Faculty characteristics include demographics (age, race, ethnicity, and gender) and appointment types (tenure-track, renewable-contract, and fixed-term appointments). Institutional characteristics include culture and norms, governance and structure, leadership, reward structure, resources (fiscal, human, and physical), and mission. Their outcomes for their model are as follows:

- increased faculty satisfaction and sense of meaningfulness;
- increased organizational commitment;
- enhanced recruitment and retention;
- broader spectrum of individuals represented on the faculty; and
- more strategic utilization of intellectual capital.

Grappa et al. proposed that their framework could serve as a tool for institutions to evaluate their current academic environment and identify potential changes to improve their overall excellence.

In summary, the frameworks discussed have two key influences on faculty work that were employed for this study: environmental characteristics and individual characteristics. Environmental characteristics include institutional and disciplinary culture, norms, and policies. Individual characteristics include demographic

characteristics such as gender and career characteristics such as appointment type. Now that these characteristics have been identified, we will look at the research on how they have been defined and observed to influence faculty work.

Institution

This study used two possible classifications of institutions: Carnegie Classification and market segments. Reviewing the literature on the effects of institutional type on faculty work, it appears that most has focused on the use of the Carnegie Classification. The Basic Classification has five categories: Research and doctoral universities, Comprehensive universities and colleges, Liberal Arts colleges, Two-year colleges, and Specialized institutions. Research and doctoral universities offer a wide range of baccalaureate and graduate programs, place a high priority on research, and is distinguished by the amount of federal support received for research and development and by the number of doctorates awarded per year. Comprehensive (Master's) universities and colleges offer baccalaureate programs, graduate work through Master's degrees and professional fields, and some doctorates in selected fields with less than forty in fewer than five different fields. Liberal Arts colleges are focused primarily on baccalaureate programs. Two-year (Associate) colleges are junior colleges, community colleges, and technical institutions offering mostly two-year degrees and certificates. Specialized institutions offer degrees ranging from baccalaureates to doctorates, are not affiliated with colleges or universities, and include theological seminaries, medical centers, and independent schools of art and music. The five classification names have changed over the years, but the criteria for membership in each

of the categories remains consistent in the criteria: program/degrees awarded and level of research and grants.

Clark (1987) proposed the metaphor of "small worlds, different worlds" to describe how academic life is differentiated by institutional and disciplinary differences. He studied faculty work by looking at teaching and research through the lens of an institutional-disciplinary matrix, investigating the differences between six fields in six types of institutions using the 1984 Carnegie survey and interviews. He noted that academic beliefs were influenced by the institution at which the faculty resides. At research universities, discipline was very important and institutional reputation for scholarship and research was highly valued; therefore, more overall resources and facilities were devoted to support scholarship and research. Liberal Arts colleges tended to be smaller environments where students and colleagues were valued more.

Also affected by institution are their expectations of faculty work load. "Professors, administrators, and trustees alike nearly always define it (work load) as the amount of time spent in classroom teaching—'the teaching load.' Professors are as sharply aware of this as are workers concerned about a thirty- or forty-hour week" (Clark, 1987, pp. 72). What is not as clear is the time spent on research or even service. Generally, national surveys estimate the average teaching load, ranging from seven to ten hours per week, but these estimates may be useless since some professor teach only two hours per week versus others may teach fifteen to twenty hours a week (Clark, 1987, pp. 73). Therefore, the 1984 Carnegie survey did not use a single measure for their weekly teaching load. Instead, it asked separately about undergraduate and graduate teaching. The results were that the majority of faculty research institutions were teaching

undergraduates at an estimated teaching load of 4 to 6 hours a week; the doctoral, comprehensive, and liberal arts institutions' load was 9 to 12 hours, and two-year colleges averaged 15 hours. In addition, the instruction of types students shifted between graduate and undergraduate, along the continuum of research, to two-year institutions.

Time and effort spent on research is reciprocal to the time and effort made towards teaching. In the research institutions, faculty spend more time and effort on research, whereas the faculty in liberal arts and two-year colleges spend more time and effort on teaching.

Blackburn et. al. (1991) and Blackburn and Lawrence (1995) looked to see if one could predict faculty teaching, research, scholarship, and service behavior using their lens of motivators for faculty work. Included in their list of possible motivators was perceptions of the environment: “For example, some questions focused on respondents’ perception of institutional role expectations and goals of undergraduate education (Blackburn et. al., 1991, pp. 366). The data they used was from a national survey conducted by the National Center for Research to Improve Postsecondary Teaching and Learning (NCRIPTAL) in 1987-88. The study on teaching focused on responses from research universities, comprehensive colleges and universities, and two-year public institutions to represent the extremes of the percentage of time given by faculty to teaching. Using a stepwise regression over all the factors to predict the percentage of time given to teaching, they found that perception of institutional preference towards teaching was a significant predictor for the percentage of time given to teaching for two-year public and comprehensive institutions, but not for research institutions.

In their study on research, scholarship, and service, Blackburn et al. (1991) used all the Carnegie institutional types except for two-year private institutions. Their rationale was that this would give a full range of possible exceptions: “from little research and medium-sized classes with no graduate students in community colleges to a significant research effort and graduate seminars mixed with large classes and supervising TAs in research universities" (Blackburn et. al., 1991, pp. 390). A stepwise regression analysis was conducted to predict research work measured by three outcome variables: productivity, presentation of work on and off campus, and collegial conversations regarding research. Institutional preference towards research was found to be a significant predictor for research work for research and community colleges. The outcome variables for scholarship were attendance of a visiting lecturer’s presentation on campus, a telephone conversation with colleagues to discuss scholarly work, and going off-campus for a meeting on teaching within discipline. Institutional preference was found to be a significant predictor.

The analysis of service used three dependent variables: public service (served as a guest on a local radio or television show), professional service (reviewed articles for a professional journal, organized a professional meeting, and edited the proceedings of a professional meeting), and institutional service (participated in a campus-wide committee, chaired a campus or unit committee, assisted with the revision of curriculum, and conducted a study to help solve a unit problem). Public service was dropped from the regression analysis since they felt it was not acceptable. Institutional perception toward both types of service were found to be significant.

In "Community College Faculty Attitudes and Trends, 1997," Huber classified the community college as a "teaching institution" (pp. 24) and much of faculty as being more oriented to teaching than to research. Using the 1997 National Survey of Faculty, Huber compared community college faculty with that at the four-year institutions. From the survey, she noted that when comparing time and effort towards teaching, community college faculty, on average, spent more time teaching compared faculty at the other institutions and more time providing student tutorial aid and academic advisement. Community college faculty also spent more time preparing for teaching compared to faculty in research institutions, the same time compared to faculty at doctoral institutions, but less than faculty at baccalaureate and Master's institutions. Scholarship for community colleges was more about keeping up to date with their fields. Only 5% of the community college faculty reported that regular research activity was expected in their position, yet about 40% reported that they were currently engaged in scholarly work such as publications, exhibits, or performances, and 20% reported receiving grants or special funding for research. Other professional activities such as consulting and professional service defined as applied scholarship were reported by 78% of the community college faculty.

In a review of faculty workload studies on the state and national level, Meyer (1998) reported that faculty spend over 40 hours per week at their jobs and that this often exceeds 50 hour per week. Looking at the state studies, there is evidence that average weekly class time and percent of time spent on teaching varies across institutional types, where the highest is two-year colleges and the lowest is public and private research and private doctoral institutions. She noted that there was a decline in the percentage of time

faculty spent on teaching-related activities from 56% in fall 1987 to 54.3% in fall 1992, using data from the U.S. Department of Education (pp. 42).

Layzell's (1999) report of faculty activities using NCES 1996 also shows how much they vary across institutional type. Specifically, faculty at two-year, liberal arts, and comprehensive institutions reported a higher percentage of effort on teaching than faculty at research or doctoral institutions, while faculty at research and doctoral universities spent a higher percentage of time on research than faculty at the other three institutional types.

Milem, Berger, and Dey (2000) conducted a study to evaluate if there had been significant changes in faculty time allocation from 1972 to either 1989 or 1992 based on the three national surveys of higher postsecondary faculty. They used the 1972 American Council on Education survey and the 1989 and 1992 surveys by the Higher Education Research Institute (HERI) for information about faculty from 99 institutions across the Carnegie Basic Classification (research, doctoral, comprehensive, liberal arts, and two-year colleges and specialized institutions). They looked at three variables of time allocation: hour per week spent in scheduled teaching and preparing for teaching, spent on research and scholarly writing, and spent on advising and counseling students. Using a hierarchical regression model, they defined block 1 to be the time allocation in 1972, percentage of faculty with doctoral degrees in 1989 and 1992, and percentage of faculty in different curricular areas in 1989 or 1992, and block 2 as the institutional type with the dependent variables being the time allocations in 1989 or 1992. They found a significant increase in time allocated to all three activities for all four-year institutions, but not for two-year institutions, with faculty at research universities reporting the highest amount of

time on research and decreasing amounts of time down to the two-year institutions. There were significant differences in teaching between doctoral, comprehensive, liberal arts, and two-year institutions, with liberal arts having the highest increase, followed by two-year, comprehensive, and, finally, doctoral institutions. Advisement of students significantly decreased for research, comprehensive, and liberal arts institutions.

Prior research is consistent across the different datasets in showing that institutional type does appear to influence faculty work. Research-oriented institutions tend to have faculty spending more time and effort on research and teaching oriented institutions tend to have faculty spending more time and effort on teaching.

Market Segment

Another way to classify institutions is using the market segments developed by Zemsky, Shaman, and Iannozzi (Gumport, 1997) based on the premise that institutions could be categorized by a market segments that reflect the undergraduate market niches they serve. They sought to create an analytic framework that would use a few data elements available for most baccalaureate institutions, "measure, in some combination, market position and product rather than resources, reputation, or the quality of the student body" (Gumport, 1997, p. 24), and "have intuitive meaning to institutions, students, and their parents, as well as to public policymakers" (p. 24). The result was a topography that used admit and yield rates, five-year graduation rates, percentage of part-time undergraduate enrollment, and ratio of baccalaureate degrees (BA/BS) to total undergraduate enrollment. There were seven market segments—name-brand (1 – 3), core (4 - 5, and convenience/user friendly (6 – 7) —that defined the shape of the postsecondary market.

The name-brand institutions are characterized by having high demand and selectivity, a majority of the students who are full-time, high five-year graduation rates, and most of the enrolled undergraduates attaining BA/BS degrees. The convenience/user friendly institutions on the other side of the spectrum had more open admissions, more than 25% of the students were part-time, less than 50% had five-year graduation rates, and no more than 15% of the students attained a BA/BS degree. The center market segment is the core segment, which contains the majority of the four-year institutions. The core market segment would have moderate demand and selectivity, would have at least 50% of students graduating in five years, no more than 25% of the students attending part-time, and at least 15% of the students attaining a BA/BS degree. For example, Princeton would be in the name-brand segment, University of Rhode Island could be in the core segment, and Quinnipiac University could be in the convenience/user friendly segment. Community colleges are an extension of the convenience/user friendly segment and were further classified by their focus, percentage of part-time students, and ratio of degrees or certificates to their enrollment.

The primary research conducted with the market segment taxonomy was looking at the characteristics of the postsecondary market in terms of price, cost and the nature of their educational programs, and student outcomes. Zemsky et al. (Gumport, 1997; 2001) used the market segments and some of the traditional institution types (public/private, liberal arts/others) to compare tuition, institutional financial aid as percentage of tuition revenue, and net revenue per full-time equivalent student as examples of information that can be gleaned to describe or compare institutions in different market niches. They also profiled students using the market segments of age, ethnicity, educational attainment,

annual salary/wages 10 years after high school, voting, and volunteering. They also compared average salaries across ranks, ratio of students to faculty, and percentage of part-time faculty.

Zemsky et al. (2001) further refined the market segments by defining five segments for private institutions and four segments for public institutions through their "Slider Analysis." The slider analysis was a series of regression analyses to map the market terrain by comparing two adjacent segments with the same regression model to distinguish their differences. Again, the focus of the use of market segments was to distinguish the market niche based on percentage of part-time students, undergraduate degree production ratio, and five-year graduation rate.

Zemsky, Wagner, and Massey (2005) continued to use the taxonomy of market segments to help distinguish institutions and speak about policies for American universities to be market-smart and mission centered. Therefore, there is reason for using market segment as a gage of institutional expectations and mission that would influence faculty work, but no research seems to have been done to this end.

Discipline

The classification schemes for disciplines before the late 1990s are based upon the notion that individual fields of study have different levels of consensus and structure. "High paradigmatic fields have high levels of agreement among their practitioners regarding issues such as appropriate research topics and methods (Braxton & Hargens, 1996). Low paradigmatic fields, on the other hand, exhibit less agreement about the appropriate research questions for their field and even less agreement on the appropriate

methodology for addressing these questions" (Braxton & Hargens, 1996; Kuhn, 1962, 1970)" (in Jones, 2011, pp. 11).

There are two classification systems for disciplines that have been used for research about faculty work: Biglan's classification (Biglan, 1973) and Holland's Academic Environments (Holland, 1997). Biglan's classification uses three-dimensional pairs to classify disciplines: hard/soft, pure/applied, and life/non-life. Holland's Academic Environments is based Holland's person-environment fit theory, which classifies six types (Realistic, Investigative, Artistic, Social, Enterprising, Conventional) based on patterns of attitudes, interests, and abilities analogous to personality types (Smart and Umbach, 2007). Disciplines classified using Holland's theory would have a primary/dominant and a secondary type.

Biglan (1973) is the most-used classification scheme for examining differences among disciplines. Using multidimensional scaling analysis, Biglan reported that faculty similarities regarding various attitudes and behaviors could be summarized by three dimensions: hard/soft, applied/pure, and life/nonlife. The strongest dimension is the hard/soft dimension, which is based on the level of paradigmatic development within a field. Disciplines high in paradigmatic development are chemistry, physics, and engineering, and they are classified as hard disciplines. Disciplines such as sociology, history, and education are lower in paradigmatic development and are classified as soft disciplines. The dimension of pure/applied is based on the applicability of the scholarship to that discipline. The life/nonlife dimension is the level to which scholarship in each field involves the study of life. Research on faculty teaching and research primarily has focused on the hard/soft and pure/applied disciplinary difference. Clark's (1987, 1997)

work on academic life, “Small World, Different World,” mentioned before, looked at the matrix of institutional and disciplinary influences on faculty work. Discipline determines the nature of the work done and how it is valued. Using the cultures of discipline (Betcher, 1987), Clark make a comparison of hard versus soft disciplines and pure versus applied for a fourfold classification of the disciplines, and he described the characteristics of work and how it is valued given the disciplinary categories.

Braxton, Olsen, and Simmons (1998) used the Biglan classification scheme to examine disciplinary differences in undergraduate teaching practices. Using hierarchical multiple regression, they found that there was no significant difference between faculty in a hard discipline versus a soft discipline in providing prompt feedback to students, encouraging cooperation, and emphasizing time on tasks. There was a significance result for soft discipline faculty for the use of active learning techniques, valuing diversity, having contact with students, and having higher expectations of students.

Colbeck (1998) compared English (a soft discipline) and Physics (a hard discipline) from two public four-year universities to examine the extent to which faculty in soft and hard disciplines integrate research into other aspects of their job. While both integrated their research into other areas of their work, the Physics professors would use their research to train their students on how to conduct research whereas the English professors integrated their research into their classes. Barnes et al. (2001) examined the disciplinary differences in faculty attitudes about teaching goals and grading through descriptive statistics and regression analysis. They found that faculty in the hard fields were more likely than faculty in the soft fields to select “subject matter facts and

principles" as their primary teaching goal. Faculty in soft fields were more likely to select "student development" as their primary teaching goal (Barnes et al., 2001).

Becher and Trowler (2001) used Biglan's model, along with Kolb's (1981) research on students' learning styles, to create their classification of disciplines and the nature of knowledge (Refer to Table 2.1). Their main goal was to explore the interconnections between academic culture and the nature of discipline. Using their classification of discipline (hard/soft, pure/applied), they investigated the influence of academic tribes (disciplinary groupings) on several aspects of academic life, including socialization, specialization of research, community life, patterns of communications, and factors that affect academic career.

Table 2.1 Disciplinary groups and their corresponding knowledge

Disciplinary grouping	Discipline (examples)	Nature of knowledge
Hard-pure	Pure Sciences (e.g. physics)	Cumulative; atomistic; concerned with universals, quantities, simplification; impersonal, value-free; clear criteria for knowledge verification and obsolescence; consensus over significant questions to address; results in discovery/explanation
Soft-pure	Humanities (e.g. history)	Reiterative; holistic (organic); concerned with qualities, complication; personal, value-laden; dispute over criteria for knowledge verification and obsolescence; lack of consensus over significant questions to address; results in understanding/ interpretation
Hard-applied	Technologies (e.g. mechanical engineering, clinical medicine)	Purposive; pragmatic (know-how via hard knowledge); concerned with mastery of physical environment; applies heuristic approaches; criteria for judgment are purposive, functional; results in products/techniques
Soft-applied	Applied social science (e.g. education, law, social administration)	Functional; utilitarian (know-how via soft knowledge); concerned with enhancement of [semi-] professional practice; uses case studies and case law; results in protocols/ procedures

Note: Table derived from Becher and Towler, 2001, pp 36

Faculty beliefs about teaching and learning were also the focus of a study conducted by Nelson Laird, Schwartz, Kuh, and Shoup (2006). In their study of faculty at 109 American colleges and universities, they examined disciplinary differences in

faculty's emphasis on the use of deep learning. The findings of the study indicated that faculty in soft disciplines such as education, the humanities, and the social sciences emphasized deep learning more than their colleagues in the hard disciplines.

Another classification of academic disciplines that has been utilized within the higher education research is the classification system developed by Holland (1997). Holland's Theory of Occupational Classification is a personality-based career development framework with the premise that career choice will be influenced by individual skills and abilities and, in turn, individuals will seek out environments that alignment with their personality type. Holland's Academic Environments is analogous to Holland's person-environment fit theory, which classifies six types (realistic, investigative, artistic, social, enterprising, conventional) based on disciplinary patterns of attitudes, interests, and activities (Smart and Umbach, 2007).

Smart et al. (2000) used Holland's framework to classify various academic disciplines using the Educational Opportunity Finder (Rosen, Holmberg & Holland, 1994). Smart et al. excluded two of Holland's types—realistic and conventional—since very few faculty and college students fall into these categories. Many academic disciplines will have a primary category and a secondary category. For example, ethnic studies has the primary category of a social field and secondary of an investigative field (see Table 2.2).

Table 2.2 Academic disciplines by Holland type utilized by Smart et al. (2000)

Type	Academic Disciplines
Investigative	Allied health/medical technologies, biology and life sciences, economics, geography, math/statistics, physical sciences, finance, aeronautical engineering, civil engineering, chemical engineering, astronomy, earth science, anthropology, ethnic studies, geography, and sociology
Artistic	Architecture, fine arts (art, drama, music), foreign languages, English, speech, environmental designs
Social	Ethnic studies, home economics, humanities (history, philosophy, religion, rhetoric), library science, physical and health education, psychology, social sciences (anthropology, political science, social work), elementary education, special education, nursing, and law enforcement
Enterprising	Business, communications, computer/information science, law, public affairs, journalism, marketing, industrial engineering, and business education

Research on college faculty using the Holland classification scheme is based primarily on the idea that "faculty create academic environments inclined to require, reinforce, and reward the distinctive patterns of abilities and interests of students in a manner consistent with Holland's theory" (Smart et al. 2000, p. 96). This socialization

hypothesis has been the basis for several recent studies on the professoriate. Smart et al. found that “faculty members in different clusters of academic disciplines create distinctly different academic environments because of their preference for alternative goals for undergraduate education, their emphasis on alternative teaching goals and student competencies in their respective classes, and their reliance on different approaches to classroom instruction and ways of interacting with students inside and outside their classes” (p. 238).

Smart and Thompson (2001) examined 587 full-time faculty at a doctoral university and their level of emphasis on developing students’ competencies in their classes. The result of their 4 x 2 multivariate analysis of variance showed that faculty tended to emphasize competencies related to their Holland academic environment. For example, investigative faculty stressed analytical and mathematical skills and placed less emphasis on acquiring "enterprising" skills like leadership and persuasive skills.

Umbach’s (2006) study of over 13,000 faculty at 134 colleges and universities used hierarchical linear modeling to find evidence that supported the differences in teaching practices among the different academic disciplines. For example, faculty in realistic fields are more likely than other faculty to use active and collaborative techniques in their instruction. Smart and Umbach (2007) examined disciplinary differences in how faculty designed and structured their undergraduate classes. Using a multivariate analysis of variance on data from over 14,000 faculty members, they found significant differences in how the four academic environments structured and designed classes. One example is that realistic faculty tended to structure their courses to

emphasize career and communication skills, whereas the other three disciplines focused on the students' ability to understand themselves and others.

Smart et al. (2009) examined the extent to which faculty in academic environments based on the Holland classification emphasized different student learning outcomes in their classrooms. This study found that faculty in different academic fields emphasize different student learning outcomes.

In summary, the research does show evidence that discipline influences faculty work in teaching and research. There are two main classifications of discipline: Biglan's model and Holland's model. Both add information about the culture of the disciplines in each of the categories.

Appointment Type

Appointment type is described mostly in terms of whether there is tenure available at the institution. There are three main categories: tenure/tenure-track, non-tenure, and no tenure. Another way that faculty appointments have been described is either tenure-track or non-tenure track. The non-tenure-track appointments are then further defined by the nature of the contract held: contract-renewable or fixed-term (Gappa et. al., 2007; Finkelstein and Schuster, 2001, 2006; O'Meara, Terosky, & Neumann, 2008). Contract-renewable appointments tend to be offered to faculty as an alternative to tenure-track appointments with the potential for long-term employment. Usually, faculty are categorized as "full-time non-tenure track" (FTNTT) or "off the tenure track" or "no tenure system at this institution" (Gappa et. al., 2007, pp. 67). Fixed-term appointments are temporary and usually part-time in hours. The following are some of the studies that have assessed the influence of appointment type on faculty work.

Finkelstein and Schuster (2001, 2006) used the tripartite system of appointments––tenure track, renewable contracts, and fixed-term or temporary—to describe faculty. They noted that there are institutional benefits to using an increasing number of renewable contracts and fixed-term or temporary contracts for immediate flexibility and cost savings, but that institutions may fail to consider long-term impact on the faculty and academic workplace. Tenure-track faculty are seen as the traditional "prototypical American scholar" (Boyer, 1990) or "complete scholar" (Rice, 1996) engaged in teaching, research, and service, whereas faculty with renewable appointments tend to specialize in teaching or research responsibilities. Faculty with fixed term or temporary appointments are usually dedicated to teaching specific courses. Thus, faculty are specialized in their work by the nature of their appointment type. Finkelstein and Schuster (2006) found that FTNTT faculty were less likely to publish or do other research related activities, worked five fewer hours per week, and spent less time out of class with students compared to their tenure-track counterparts.

A study by Bland et al. (2006) indicated that the effects of these different employment practices may influence FTNTT faculty productivity in research and doctoral institutions. Using data from the National Study of Postsecondary Faculty (NSOPF, 1999), they conducted a three-way multivariate analysis of variance to examine faculty productivity in both research and teaching as well as faculty commitment. Their conceptual framework included the idea that the tenure-faculty personnel system influences faculty productivity and commitment in four ways: assures “the presence of environmental features essential for productivity,” increases “faculty commitments that facilitate productivity,” “promotes productivity by increasing motivation and providing a

process for the institution to promote and retain only the high performers," and "requires faculty to commit significant effort to and be productive in at least three areas: teaching, research, and service" (pp. 99-100).

When looking at research productivity, Bland et al. collapsed the appointment types to tenure and non-tenure track and used seven measures of research productivity along with degree and role focus: differentiated (faculty coming over 74% time to one role) and comprehensive (faculty having multiple roles, with no role at 74% time or more). Their results were that there was no significant interaction between appointment type and role focus, a significant interaction with appointment type and degree, and most of the scholarly products were significantly higher for tenure-track faculty compared to their counterpart non-tenure track faculty. Notably tenured faculty produced, on average, about double the number of products that non-tenure faculty did. Also, tenured faculty reported working an average of four more hours per week than non-tenured faculty.

Their results for teaching productivity also found significant differences between tenure and non-tenured faculty. They differentiated teaching productivity between direct and indirect teaching. For direct teaching measures, tenured faculty were significantly higher in total courses taught, total credit classes taught, and total hours spent teaching each week, whereas non-tenured faculty were significantly higher in total hours spent giving individual student instruction and total office hours spent advising assigned advisees. For indirect teaching measures, which included committee work and student contact hours, tenured faculty were significantly higher than non-tenured.

Another study, by Baldwin and Wawrzynski (2011), explored the extent to which teaching practices and technology differed by appointment type and academic

environment using Holland's theory. Using 2004 National Study of Postsecondary Faculty (NSOPF:04), they did a correlational analysis and chi-square test for independence to determine the relationship between appointment type, defined as permanent (tenured, tenure-eligible) versus contingent (part-time and full-time non-tenure track), academic environment, and teaching strategies (learning-centered or subject-centered). Their results showed that full-time non-tenure track faculty were similar to their tenured or tenure-eligible colleagues compared to the part-time non-tenure track colleagues. They also found that academic environments (Holland's career types) did have a significant relationship with teaching strategies. The faculty in Holland's conventional category (e.g., accounting, finance) were the same in their teaching strategies regardless of appointment, while there were differences among the other categories, primarily between part-time contingent and full-time permanent and contingent faculty.

Kezar (2012) cited several case studies about non-tenure track faculty and the influences on institutional and departmental policies shaping what they do. Changing the normative model of faculty to include non-tenure track faculty in curriculum planning, professional development activities, and compensated office hours, and encouraging them to be a part of the leadership role in governance and institutional affairs, helps to create a better work environment and permits the faculty to engage in a fuller academic life.

Kezar (2013) conducted a qualitative case study to examine NTTF perceptions of department practice and policies that affect their teaching performance through interviews with 107 faculty within 25 departments in 3 four-year institutions. Kezar was

interested in comparing NTTF in departments that had supportive policies in place versus those that did not. The results presented that NTTF members perceived that departmental policies shaped their performance and ability to create quality learning experiences. Unsupportive policies impacted preparation, advising possibilities, and curricular designs, resulting in missing key materials, among many other negative results.

In summary, the research on appointment type and its influence on faculty work generally stated that there were differences between tenure/tenure-track faculty and non-tenure track faculty. However, it is unclear if these differences were more because of the environment—institutional or discipline—or because of the nature of the appointment type.

Gender

There has been plenty of research looking at the effects of gender on faculty work. The main measures of faculty work that have been compared by gender have been time allocation, teaching and research activities, and research/scholarly products. The following will review some of the research looking at how gender affects faculty work.

Blackburn et al. (1991) included gender in their predictive models for teaching, research, and service work. Since prior research had found differences in research productivity (cited Astin, 1978), they included gender as a possible predictor for teaching. They focused their comparisons between two-year, comprehensive (Master's), and research among three disciplines: English, chemistry, and psychology. Female faculty in English tended to be the majority (between 31% and 42.6%) across the institutional types, which they noted is an above average percentage of women compared to all the other disciplines. Their regression analysis found that gender was not a

significant predictor for percentage of time allocated to teaching. This indicated that perhaps gender differences were not as significant as they had been in the past. Looking at previous research, gender again was not a significant predictor for research publications or making presentations on campus and at conferences, even though prior research found that men published more than women. However, gender was a significant predictor for their third research outcome, collegial conversations. For the three measures of service, gender was not a significant predictor.

Twale and Shannon (1996) conducted a survey of members of the University of Council for Educational Administrators (UCEA) to determine if there would be significant differences in professional service involvement of leadership faculty by gender. There were no significant gender differences in professional involvement, but there were differences in the types of committees that women served on versus their male colleagues: "Women reported serving on nominating, membership, awards, graduate student, and steering committees while men reported sitting on leadership, policy, and assessment committees" (pp 120-121). The researchers also noted differences in involvement with professional conferences and the positions at the conferences. Finally, they found that while women reported higher levels of satisfaction with their professional service roles, there was no significant difference between men and women.

In an analysis using NSOPF 1993 data, Bellas and Toutkoushian (1999) found that women spent significantly more time teaching then men and less time on research. There was no significant difference in the percentage of time for service activities. They indicated that there was not clear reason for the difference but speculated that the difference may be due to women being assigned to heavier

teaching loads than their male colleagues or women spending more time in preparation for classes then men. They also conducted a regression analysis to predict research output using three alternative measures—journal articles, chapters, books (excluding textbooks), and patents—and they added juried exhibitions and creative works along with other categories, such as non-refereed publications. Their results showed that women were significantly lower in all three of the groupings, with the largest difference occurring when they had added juried exhibitions and creative works, but the gender difference was explained by more than 50% by other variables in the regression model. Interestingly, NSOPF-93 data did not account for what faculty did during the summer months.

Another study used data from HERI 1998-1999 survey to explore the role of gender and family-related factors in research productivity, defined by publications in the past two years (Sax, Hagedorn, Arredondo, and Dicrisi, 2002). They first looked at the gender gap for publications over three surveys—American Council of Educators 1972, HERI 1987-1988, and HERI 1998-1999—and reported that the gender gap was cut in half for non-publishing faculty, had virtually disappeared for faculty that published 1 to 2 times, but remained the same for faculty with five or more publications. Their study compared four groups based on gender and tenure versus non-tenure categories and found that demographics, institution, discipline (department), and professional variables were all significant predictors for publications. Being at a public institution was a significant positive predictor for both men and women with tenure. The discipline of the department was categorized using Biglan's categories (hard/soft, pure/applied, life/nonlife). Pure (history, chemistry, physics, etc.) departments had a modest positive relationship for non-tenured women and all men. Hard (biochemistry, chemistry, engineering, etc.)

departments were higher for tenured women and all men. Life (biology, sociology, etc.) were higher for tenured women only. The researchers reported that family-related factors were not significant predictors of publication for anyone.

Lester (2008) spoke of gender roles within the context of an urban community college. In her ethnographic case study of six women faculty members from a high female representative academic department (Language Arts/English) or low female representative vocation departments (Construction technologies and Culinary Arts), she explored gendered performance in the context of departmental culture. There were three observations made: women faculty expressed that they were expected to perform the "mom" role as caregiver with students and the secretarial role (managing committees and organizing social activities) within the department, and social interactions with colleagues and students, and the expectation of the role of caregiver and departmental secretary was reaffirmed. Women created a hybrid performance, balancing femininity and masculinity to negotiate their environments: classroom and department. While there was no information about actual measurable performance in their faculty work, her results do support the view that there are expectations for gendered performance in higher education institutions.

Link, Swann, and Bozeman's (2008) study on time allocation of science and engineering faculty at research/doctoral universities used data from the National Science Foundation/Department of Energy Survey of Academic Researchers. The results from their regression analysis showed that gender was a significant predictor for hours and fraction of time allocated to research, grant writing, and service. Male faculty averaged 1.8 hours more toward research, while female faculty spent, on average, one hour more

on grant writing and 1.6 hours more on service. They also looked at tenure and found that tenured faculty worked, on average, fewer hours, and tenure was significant in predicting research, grant writing, and service. Tenured faculty spent less time on research and grant writing while spending more time on service.

Cummings and Finkelstein (2010) compared the 1992 Carnegie survey with the 2007 Changing Academic Professions (CAP) survey and found that there were gender differences in teaching and research. For both 1992 and 2007 data, men, on average, spent more hours per week on research and published more than women, whereas women spent more time on teaching. However, there was a decline in the percent difference (men versus women) for these measures of faculty work. The percent difference for articles published in three years dramatically dropped from 67.6% to 29.7%. They also compared hours per week spent on teaching and research and average articles published by discipline and gender. While the trend was men spending more time on research and publishing and women spending more time on teaching for most of the disciplines for both 1992 and 2007, there was a switch in other fields (including professions) where women spent more hours on research and published more articles than men.

Using the 1999 NSOPF data, Winslow (2010) conducted a regression analysis to explore gender differences and time allocation. She looked at three measures for time allocation for teaching and research: preferred percent, actual percent, and mismatches (difference of preferred and actual percent). She found that women preferred to spend more time teaching and less time on research while perceiving that their institution valued research over teaching. For actual percentage of time allocated, women spent about 4% more time per week on teaching than men (56% versus 52%) and spent 5% less

of their work-week on research compared to their male colleagues. In an analysis of time allocation mismatch, women preferred to spend close to 2% less of their work-week on teaching, but there were no significant differences in research time allocation mismatches. "A sizeable portion of the gap in teaching and research time allocations can be explained by gender-differentiated (and constrained) preferences, women's lower likelihood of having a doctorate degree, their overrepresentation in teaching-intensive ranks and institutional types, and their underrepresentation in research-intensive ranks and institution types" (pp. 787).

When looking at gender differences in service work, Misra, Lundquist, Holmes, and Agiomavritis (2011) found that there were gender differences in time spent on mentoring and service by women faculty at a research-intensive university. Comparing faculty by rank, they found that men and women with ranks of lecturer, assistant professor, and full professor spent approximately the same amount of time on teaching and research, but women spent a bit more time on mentoring and service. There was a significant gender difference for associate professors even though they worked similar hours overall (about 65 hours per week). Men spent 7.5 more hours per week on research. Women taught one hour more per week, mentored two more hours per week, and spent five more hours on service. Similar gender differences occurred when comparing STEM faculty with non-STEM faculty. Male STEM faculty spent more time on research (42%) than their female colleagues (27%), while female STEM faculty spent more time mentoring and performing service.

Kessler et al. (2014) studied gender differences in job satisfaction and research productivity related to elements of the department (teaching orientation and structure)

using data from 1,135 psychology faculty in 229 academic departments. The results were that women reported lower levels of productivity compared to their male counterparts. Women reported higher levels of job satisfaction in more teaching-oriented departments, whereas males reported higher levels of job satisfaction in more research-oriented departments.

In summary, gender does influence faculty work; specifically, prior research has shown that women tend to spend more time on teaching and service whereas men spend more time on research. These results span over the past twenty years as well as several sources of data. Prior research on gender differences in faculty work has shown that these differences are also influenced by institutional type, discipline, and appointment type.

Summary

The review of the literature has reviewed how faculty work is measured, theoretical frameworks for influences on faculty work, and the prior research on the influences to be explored by this study: institution type as defined by the Carnegie Classification, market segments, appointment type, and gender. Faculty work is generally measure by time allocation for teaching, research, and service as well as activities and research/scholarly contributions such as publications. The theoretical framework proposed by Blackburn and Lawrence explains that faculty work is influenced by environmental and individual factors. Clark's metaphor of "small world, different worlds" further supports the premise that faculty work is influenced by institutional and disciplinary expectations and culture. Prior research on the influence on faculty work by institutional type, discipline, appointment type, and gender have shown that, over the past twenty years, there have been general trends in what faculty do as well as support that

faculty work can be predicted by these factors. The lack of research using market segments as a predictor or influence on faculty work provides an opportunity to view a possible lens to view differences in faculty work. Chapter 3 will explain how this study used this information to explore these influences on faculty and what they do.

Chapter 3

Research Design and Methodology

Introduction

The structure and character of academic work is influenced by the type of institution in which faculty members work, their academic disciplines, and other characteristics of the faculty, including appointment type and gender. Zemsky and his team (Gumport, 1997; Zemsky et al., 1998, 2001, 2005) and others have suggested that differentiation among institutions, which has historically been structured along level of degree offerings and size/complexity, is now becoming increasingly structured along the lines of market segments, with many non-selective four-year institutions increasingly resembling two-year "convenience" institutions in terms of their academic organization. The purpose of this study was to test the extent to which academic work is increasingly organized by institutional market segments rather than traditional categories of institutional types and whether the shaping influences of discipline, type of appointment, and gender persist within these institutional market segment categories. This study used 2007-2008 data from the Changing Academic Profession (CAP) survey to compare faculty work at institutions alternatively categorized by traditional institutional type and their market segments.

This chapter reviews the theoretical framework used for the study, the research questions that were explored, a summary of the data and variables used in the analysis, and the research design, including the methodology and rationale for the analytical methods used to answer the research questions.

Theoretical Framework

The theoretical lens employed for looking at faculty role performance and the influences on faculty work is Blackburn and Lawrence's (1995) predictive model of the behavior and the products of faculty work. Blackburn and Lawrence followed the premise that faculty behavior can be accounted for by cognitive and non-cognitive motivation in that work decisions are influenced by what they perceive as the expectations of the environment (i.e., institution and discipline) as well as faculty's own interactions with who they are (i.e., gender) and their career stages or professional characteristics (i.e., appointment type). The outcomes of this model (behavior and products) can include the proportion of time and effort given to teaching, research, and service and the number of publications (research product).

Motivational theories. There are two motivational theories linking the factors that influence faculty's decisions on how they behave within the context of their position: non-cognitive and cognitive. Non-cognitive theories of motivation are developed from the premise "that internal needs, personality dispositions and external incentives and rewards will cause an individual to behave in predictable ways" (Blackburn & Lawrence, 1995, pp. 19), whereas cognitive theories of motivation center around the "individual's subjective estimates of the probability of task success (expectancy) and of consequences of their actions (value)" (Blackburn & Lawrence, 1995, pp. 21).

An example of non-cognitive motivational theory is Holland's person-environment fit theory, which describes personal dispositions within the context of their environment. From the personality perspective, Holland's theory states that there are six

personality types: Realistic, Investigative, Artistic, Social, Enterprising, and Conventional. Research by Holland and others has shown that the choice of a career or field (discipline) is an expression of these personality types (Holland, 1997; Gottfredson & Richards, 1999; Morstain & Smart,1976; Smart & Umbach, 2007). The underlying premise is that faculty will seek out environments and work activities that are congruent with their skills, abilities, attitudes, and values. Holland and his colleagues found that the environment can also be classified using these six. Others have demonstrated that faculty structured their undergraduate courses and academic environments to reinforce and reward students, consistent with Holland's Academic Environments (Smart & Umbach, 2007).

There are four cognitive motivational theories that are relevant to the model: expectancy, attribution, efficacy, and information-processing. An example of expectancy theory is Maehr and Braskamp's (1986) personal investment theory. This expectancy theory states that people are constantly making decisions about how to invest their time and effort based on their sense of self and their perception/assessment of the value of the activity. The sense of self includes estimates of personal control over the situation, self-competence, and goal-directedness.

An extension of expectancy theory is attribution theory, which focuses on the individual's causal attributions that influence the expectation of success. Weiner (1985) proposed that an individual's belief in the likelihood of success is caused by the person's perception of locus of control (themselves versus others), the stability of determining factors, and the controllability of internal factors. He also proposed that personal satisfaction or value will also motivate them Theories of self-efficacy are grounded in

the premise that the level of effort or engagement in a task will be related to individuals' confidence in their abilities as well as their belief that their efforts will achieve success. According to Bandura (1982), self-efficacy is task-specific and past experience, as both learning and performance are key determinants of the decisions the individual makes.

Information-processing theory focuses more on the processing of information through schemas, prototypes, or scripts. Showers and Cantor (1985) proposed that cognitive strategies are affected by the individual's expertise, goals, and mood.

Predictive model of faculty role performance and achievement. Most research about faculty work tends to focus on either the properties of the individual or properties of the environment as these relate to work behavior and productivity. Utilizing the premise of Holland's person-environment fit theory along with cognitive motivation theories, it is logical that a model could be constructed to combine the factors associated with the characteristics of the individual and properties of the environment to explain or predict how faculty will behave in their roles—namely, what they do and produce relative to themselves and in relation to their environments. The predictive model of faculty role performance and achievement in teaching, research, and service proposed by Blackburn and Lawrence (Blackburn et al., 1991; Blackburn & Lawrence, 1995) was used to determine the work behavior and products of the faculty from the individual's characteristics along with the environmental factors.

The four constructs of individual characteristics used for the model were socio-demographic characteristics, career, self-knowledge, and social knowledge. The socio-demographic characteristics included age, racial/ethnicity, and gender. Career characteristics included discipline, types of positions, career age (the number of years in

a full-time faculty appointment), and prior accomplishments such as publications, awards, grant, and fellowships. The self-knowledge construct focuses on one's understanding of self, such as self-image, self-assessed competence, self-efficacy, personal attitudes, and values with respect to the faculty role and disposition (ambition, persistence, and supportiveness). The social knowledge construct focuses on how the individual perceives their environment, its expectations, its incentive structures, and its subjective norms.

The three environmental constructs for the model are environmental conditions, environmental responses, and social contingencies. Environmental conditions are the structural and normative features of the institution. The structural features of the institution include its fiscal well-being, geographical location, composition of the department, system of faculty governance, composition of the student body, and quality of instructional resources. A normative feature of the institution is the understanding of the mission of the institution. The construct of environmental response refers to formal feedback about role performance; for example, whether they have been promoted, received tenure, or awarded a grant. Social contingencies are the factors of personal life, such as having children and other outside factors, that would affect the person's life.

The placement of the individual and environmental construct in the theoretical framework is grounded in previous research on the factors that affect faculty and motivational research. Starting at the basic description of the individual—socio-demographic characteristics—research and Holland's personality theory supports the view that career and self-knowledge will be directly affected by age, gender, and ethnicity. Furthermore, self-knowledge will also be affected by career experience. For

example, decisions or perceptions of what kind of work is expected by a professor would be modeled after what was experienced through undergraduate and graduate school and colored by the discipline that the individual choses.

The placement of self-knowledge in the theoretical model as primarily affecting social-knowledge follows the results of cognitive motivation research. In most studies, the individual's self-knowledge predicts how they will perceive their environment (social knowledge) more often than social perception predicts self-perception (Blackburn & Lawrence, 1995). Drawing from Holland's Academic Environment and Clark's premise of "small world, different world," social knowledge would be mediated by environmental conditions, such as the institutional type, and directly affected by environmental responses, such as institutional policies and practices (Smart & Umbach, 2007; Clark, 1987).

Shaped by social knowledge are the behaviors and products of faculty role performance and achievement. The additional influence of social contingencies (family, outside obligations) will also affect faculty behavior and products beyond the environmental and individual constructs. The model includes the natural flow of information and feedback from behaviors, products, and environmental responses, which the individual will use to adjust their self-perceptions. Also, adjustments to career are made based on receiving grants or awards, which are products of faculty work.

The outputs of faculty role performance and achievement are either behaviors or products with respect to the three main areas of faculty work: teaching, research, and service. In the context of teaching, desired measured behaviors include preparing undergraduates as scholars and time given to teaching. Teaching products include new

course creation, publishing curricular materials, and teaching awards. For research, measurable behaviors are percentage of time given to research and preference to research. Research products are the number of publications, conference presentations, and research grants awarded. Faculty service is measured by service activities in three areas: public (community volunteerism and outside service), professional (working within a professional association), and campus (i.e., campus committee, administration of a program). In summary, using a theoretical framework grounded in previous research on faculty role performance and achievement and motivational theory, this model combines the characteristics of the individual with the conditions and responses of the environment to explain the work behaviors and products of faculty. This study sought to answer questions such as, "Does the model hold true for more recent faculty, "Are faculty work trends within institutional types and disciplines similar to Clarks' (1987) "small worlds, different worlds," and "How does this model hold up with using market segments as a replacement for the traditional Carnegie Classification of institutional type influencing faculty work?"

Research Questions and Hypotheses

Using the theoretical framework to predict faculty role performance and achievement in terms of teaching, research, and service, this study sought to identify the relative shaping role of the traditional arbiters of academic work—traditional institutional type and academic field with newly emerging shaping factors, as identified earlier—to include market segment, gender, and type of appointment.

RQ1: To what extent do market segments affect faculty work patterns compared to the Carnegie Classification institutional type effect?

1. There will be a market segment effect on faculty work.
2. There will be an institutional type effect on faculty work.

RQ2: How does institutional type (Carnegie or market segment) interact with discipline in affecting faculty work patterns?

1. There will be a discipline effect on faculty work regardless of institutional type (Carnegie or market segment).
2. There will be an interaction effect on faculty work by discipline and Carnegie institution type.
3. There will be an interaction effect on faculty work by discipline and market segment.

RQ3: How does gender interact with institutional type (Carnegie or market segment) or discipline in affecting faculty work patterns?

1. There will be a significant effect by gender on faculty work.
    a. Factory work towards teaching will be higher for women.
    b. Faculty work towards research will be higher for men.
    c. Faculty work towards service will be higher for women.
2. There will be a significant interaction effect of gender and Carnegie institutional type.
3. There will be a significant interaction effect of gender and market segment.
4. There will be a significant interaction effect of gender and discipline.

RQ4: How does appointment type influence faculty work in the context of institutional type (Carnegie or market segment) and discipline?

1. There will be a significant effect by appointment type on faculty work.
    a. Non-tenure/no tenure faculty will average more work towards teaching than tenure or tenure-track faculty.
    b. Tenure and tenure-track faculty will average more work towards research than non-tenure/no tenure faculty.
2. There will be a significant interaction effect of appointment type and Carnegie institutional type.
3. There will be a significant interaction effect of appointment type and market segment.
4. There will be a significant interaction effect of appointment type and discipline.

Independent Variables

The independent variables used for the analysis of faculty role performance followed the theoretical framework in which faculty behavior is determined by properties of the individual and their work environment.

Individual characteristics.

Gender. Previous research on faculty supports the use of gender as a socio-demographic characteristic that has a significant influence on faculty role performance (Clark, 1987; Blackburn & Lawrence, 1995; Schuster & Finkelstein, 2006; Gappa, Austin & Trice, 2007; Cummings & Finkelstein, 2012).

Appointment type. Since 1993, it has been reported that most first-time, full-time

appointments to faculty positions have been off the tenure track (Schuster, 2011). Also, with the increasing bifurcation of the research universities, there is an increasing trend toward using non-tenure track faculty to serve primarily teaching responsibilities, leaving the tenure track faculty to focus on research (Geiger, 2011). A restructuring of faculty appointments with the increase of part-time faculty and non-tenure track full-time faculty has been reported across institutional type and discipline (Gappa & Leslie, 1993; Baldwin & Chronister, 2001; Schuster & Finkelstein, 2006; Kezar & Sam, 2010). Cummings and Finkelstein (2012) also state that there is a trifurcation of faculty within the restructured university, with appointments focused on one of the three aspects of faculty work: teaching (predominantly), research (usually grant related), and service (administration of academic programs, such as distance or online learning.) Therefore, the balance of the triumvirate of faculty work would also be greatly impacted by the nature of the appointment type held.

There were two questions in the CAP Survey used for determining appointment type: employment situation (full-time versus part-time employed) and duration of current employment contract. The question about employment situation asks the faculty whether they are full-time or part-time and then, within part-time, to designate either the percent of full-time or part-time work with payment per work task (e.g., courses taught). The duration of current employment contract category has four choices: permanently employed (tenured), continuously employed (no preset term, but no guarantee of permanence), fixed-term employment with permanent/continuous employment prospects (tenure-track), and fixed-term employment without permanent/continuous employment prospects (non-tenure eligible). The variable for appointment type was

coded as full-time tenure/tenure-track, full-time non-tenure track, full-time other (continuously employed, not permanent), and part-time.

Environmental conditions. Environmental conditions are the structural and normative features of the institution, which include overall institutional characteristics such as fiscal and governance structures, as well as characteristics related to the student body. There were three variables used to characterize these environmental conditions: institutional type defined by the Carnegie Classification, market segment, and discipline of current department.

Carnegie Classification. The Carnegie Classification was initially developed in the early 1970s to provide a systematic taxonomy of colleges and universities to assist with policy making and research (Carnegie Foundation, 2014). There have been several iterations of the classification from 1973 to the present version, which utilizes the 2010 modifications of the categories. The categories have been derived from empirical data ranging from the mission of the institution to enrollment information.

The version used for this study was based on the Basic Classification (Carnegie Foundation, 2005), which separates postsecondary institutions into six all-inclusive classifications: Associate's Colleges, Doctorate-granting Universities, Master's Colleges and Universities, Baccalaureate Colleges, Special Focus Institutions, and Tribal Colleges. The methodology used these classifications focused on the type of institution (four-year versus two-year), percentage of part-time versus full-time students, and type and number of degrees awarded.

Associate's Colleges included institutions where all the degrees awarded are at the associate's level or where the Baccalaureate degree accounted for less than 10% of

all undergraduate degrees. Baccalaureate Colleges included institutions that award baccalaureate degrees to at least 10% percent of all undergraduate and fewer than 50 master's degrees or 20 doctoral degrees. Master's Colleges and Universities are institutions that awarded at least 50 master's degrees and less than 20 doctoral degrees. Doctorate-granting Universities includes institutions that awarded at least 20 research doctoral degrees during the updated year (excluding doctoral-level degrees that qualify recipients for entry into professional practice, such as the JD, MD, Phar.D., DPT, etc.). Special Focus Institutions award baccalaureate or higher-level degrees where a high concentration of degrees (above 75%) is in a single field or set of related fields, such as medical schools and law schools. Tribal Colleges and Universities are members of the American Indian Higher Education Consortium. Further break-downs within the categories include location, level of research activity, federal research dollars, program size, and major field of study. For example, Doctorate-granting Universities are further broken down into three categories based on their research activity and funding: RU/VH: Research Universities with very high research, RU/H: Research Universities, and DRU: Doctoral/Research Universities. For this study, the institutional types were Associate's Colleges (Two-Year), Baccalaureate Colleges, Master's Colleges and Universities, Research Universities (includes very high and high research activity), Doctoral/Research Universities, and other institutions.

Market segment. In their 2005 article "Rethinking and reframing the Carnegie Classification," McCormick and Zhao briefly referenced several other possible classification systems for dividing the institutions. One of the options listed is Zemsky and Shaman's classification system. That framework utilizes staffing, structure, finance,

and types of undergraduate students served to distinguish the seven market segments for four-year institutions and three market segments for the two-year institutions. This study utilized the alternative classification of postsecondary institutions from the perspective of market segments as defined by Zemsky and Shaman (1997, 2001) to compare post-secondary institutions at their lowest common denominator: educating undergraduate students.

The model proposed by the National Center for Postsecondary Improvement (NCPI) maps the four-year institution to its market segment: name brand, core and convenience/user friendly (Zemsky, Shaman and Iannozzi, 1997). The scale was developed from four sets of information: admit and yield rates, percentage of freshmen who graduate with a BS or BA in five years, percentage of undergraduate enrollment that is part-time, and ratio of number of BA/BS degrees awarded to total undergraduate enrollment. There are seven market segments identified, ranging from highly selective, very competitive institutions to less selective, convenience institutions, with the bulk of four-year institutions in the center as the core market segment. The worksheet for market segment determination was published in their 1997 article and is included in Appendix B.

The continuum of the market segments for the four-year institutions (see Figure 3.1) defined by Zemsky and Shaman ranged from the name-brand sector, which follows the classic view of a baccalaureate education, to the convenience/user-friendly sector, which is composed of institutions that teach greater numbers of part-time students who may or may not be seeking a baccalaureate degree. The middle sector, the core market segment, is characterized by students who are more likely to desire a baccalaureate degree and contains a balance of full-time and part-time students. This classification

allows for distinctions between institutions in terms of the resources that are used to achieve the desired educational outcomes of the undergraduate students. Clearly, faculty work would be one of those resources and the institutional values would be greatly influential on the expectations of the faculty from this perspective.

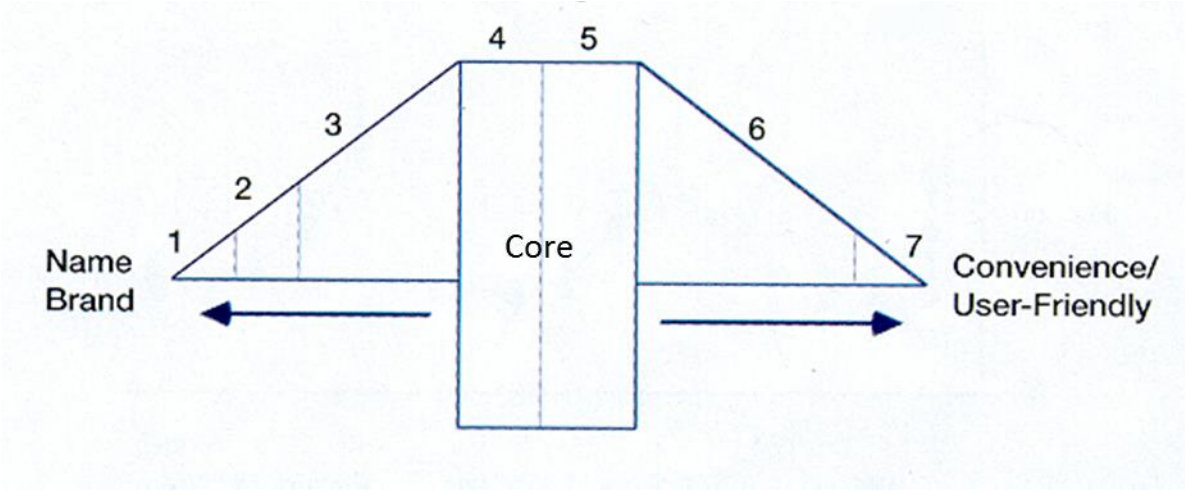

Figure 3.1 Market sectors for four-year post-secondary institutions (Zemsky, Shaman and Iannozzi, 1997)

Market segment was determined by a three-step process (Refer to Market Segment Worksheet in the Appendix A): finding the "left-edge" score, finding the "right-edge" scores, and then using a decision strategy based on those scores to determine the final market segment (1–7). The left-edge score is the likelihood that the institution would be considered in the more prestigious or elitist market segments (the name-brand market segment). The right-edge score is the likelihood that the institution would be considered part of the convenience or user-friendly segment.

The left-edge score is determined by comparing the demand score (derived from admit and yield rates) and five-year graduation rates. The name-brand market sector (segments 1, 2, and 3) comprises four-year institutions whose primary student

population desires, at minimum, a baccalaureate degree. The prestige level of these institutions range from elite institutions, which have highly selective admission policies and at least 90% five-year graduation rates, to institutions which are selective and have at least 64% of their students graduating with a baccalaureate degree within five years (refer to Table 3.1).

Table 3.1

Left-edge score for market segment

	Demand Score*			
5- Year Graduation Rate	Greater than or equal 4.0	Greater than or equal 1.5	Greater than or equal 1.0	Less than 1.0
Greater than or equal 90%	1	2	3	4
Greater than or equal 85%	2	2	3	4
Greater than or equal 64%	3	3	3	4
Greater than or equal 50%	4	4	4	4
Less than 50%	5 or higher	5 or higher	5 or higher	5 or higher

(Zemsky, Shaman and Iannozzi, 1997, pp. 38)
*Demand score is derived from admit and yield rates.

The right-edge score is the likelihood that the institution would be considered more convenience driven. with higher numbers of part-time students (greater than 25%) and fewer bachelor's degree awarded (less than 15%), placing them in market segments 5 through 7 (refer to Table 3.2). The right-edge score is determined by comparing the percentage of part-time students to the bachelor's degree awarded ratio to enrollment.

The user-friendly/convenience market sector (segments 6–10) comprises four-year institutions (segments 6, 7) and two-year institutions (segments 8, 9, 10) whose students tend to be less likely to graduate with a bachelor's degree within five years or are more likely to be in college to achieve an associate's degree or certification.

Table 3.2

Right-edge score for market segment

Bachelor's degrees to undergraduate enrollment	Percentage of Part-time students		
	More than 35%	More than 25%	Less than or equal 25%
Less than or equal 10%	7	6	5 or lower
Less than or equal 15%	6	6	5 or lower
Greater than 15%	5 or lower	5 or lower	5 or lower

(Zemsky, Shaman and Iannozzi, 1997, pp. 38)

The core market sector (segments 4 and 5) covers most of the four-year institutions in which at least 50% of students graduate with a baccalaureate degree within five years and the admissions policy is not as selective as the name-brand segment. Segment 4 is distinguished by having between 50–63% of students graduate with a baccalaureate degree within five years, whereas segment 5 has less than 50% of students complete college within five years and enrolls no more than 25% part-time students.

Zemksy et al. (1998) expanded the continuum of market segments to include two-year institutions as an extension of the convenience market segment. The two-year institutions were further classified by three focuses of the programs they offered: degree

(segment 8), mixed (segment 9), and course (segment 10). Determination of the program focus was made using the ratio of the total number of associate's degrees and certifications to the total enrollment and the ratio of full-time students to total enrollment. The degree focus segment is comprised of a higher ratio of degrees awarded and full-time students. The institutions that had between 25% and 50% full time enrollment and at least 10% degree completion were classified as mixed focus. The institutions with greater than 90% of part-time students and low (less than 10%) degree completion comprised the course focus segment. The degree focused segment looks very similar to their four-year convenience institution counterparts, with the main difference being the level of degree (bachelors versus associates or certificate). Given the small number of institutions that were represented in the CAP survey, the study focused on the three market segments of name-brand, core, and convenience to classify the institutions rather than on the full continuum of ten market segments.

Departmental discipline. Holland's Theory of Academic Environments supports the prediction that the discipline of a faculty's academic department will affect the behavior of the faculty (Smart & Umbach, 2007). Therefore, the discipline of the current primary academic department or unit that the faculty is affiliated with is also an environmental condition that affects faculty performance and achievement.

The CAP Survey used the following designations for academic discipline: teaching training and education science; humanities and arts; social and behavioral sciences; business and administration, economics; law; life sciences; physical sciences, mathematics, computer science; engineering, manufacturing and construction, architecture; agriculture; medical sciences, health related sciences, social science; and

personal services, transport services, and security services. This study utilized only one dimension of Biglan's classification (Biglan, 1973), focusing on hard versus soft disciplines. Discipline given the CAP survey were coded using the categories of hard (pure sciences, technologies) and soft (humanities, applied science) for the analysis to match the research on faculty work (Clark, 1987; Becher & Towler, 2001).

Dependent Variables

The dependent variables used in this study focused primarily on the behaviors of faculty in their role as defined by a combination of time, effort, and activities given for each of the areas of teaching, research, and service. The following will explain each of the measures used in the study.

Effort – time per week. Overall, effort given toward teaching, research, and service is the number of hours that the faculty is spending in a typical week when classes are and are not in session. The CAP Survey defined time spent for teaching as including the preparation of instructional materials and lesson plans, classroom instruction, advising students, and reading and evaluating student work. Time spent for research includes reading literature, writing, conducting research, and fieldwork. Time spent for service includes time listed for service (services to clients and/or patients, unpaid consulting, public or voluntary services), time listed for administration (committees, department meetings, paperwork), and time listed for other academic activities (professional activities not clearly attributable to any of the categories) since service is defined as public, professional, and institutional service. The hours per week for when classes were in session and were not in session served as the measurement for effort toward teaching, research, and service.

Effort – other measures. There are other measures of effort that were used in each of the three areas. For teaching, the percent of undergraduate instruction time and average number of undergraduates per course were also used to measure effort towards teaching. These have been chosen since market segments are focused on undergraduate education.

For research, the percent of peer-reviewed publications, percent of the funding for research from their institution, percent of the funding for research from government entities, and scholarly contributions in the past three years were considered. The CAP Survey asked faculty to indicate the total scholarly contributions in the past three years. The following items were included for scholarly contributions:

- Scholarly books you authored or co-authored;
- Scholarly books you edited or co-edited;
- Articles or chapters published in an academic book or journal;
- Research report/monograph written for a funded project;
- Paper presented at a scholarly conference;
- Professional article written for a newspaper or magazine;
- Patent secured on a process or invention;
- Computer program written for public use;
- Artistic work performed or exhibited;
- Video or film produced; or
- Other.

Since there was the possibility of a large range of scholarly contributions and faculty reporting a large number of small items, the value given was transformed using a logarithmic transformation (Bland, et. al., 2006).

Activities. The CAP Survey asked the faculty to select (yes/no) which teaching-, research-, and service-related activities they participated in during the current (or previous) academic year. There are ten teaching activities, seven research activities, and eight service activities listed in Table 3.3. The total number of indicated activities in each of the three areas were used in the analysis.

Table 3.3

Faculty activities indicated during the current (or previous) academic year in CAP Survey

Teaching Activities
Classroom instruction/lecturing
Individual instruction
Learning in projects/project groups
Practice instruction/laboratory work
ICT-based learning/computer-assisted learning
Distance education
Developmental of course material
Curriculum/program development
Face-to-face interaction with students outside of class
Electronic communications (e-mail) with students
Research Activities
Preparing and conducting experiments, inquiries, etc.
Supervising a research team or graduate research assistants
Writing academic papers that contain research result or findings
Technology transfer
Answering calls for proposals or writing research grants
Managing research contracts and budgets
Purchasing or selecting equipment and research supplies
Service Activities
Served as a member of national/international scientific committees/boards/bodies
Served as a peer reviewer
Served as an editor of journals/books series
Served as an elected officers or leader in professional/academic associations
Served as an elected officers or leader of unions
Participated in local, national or international politics
Served as a member of a community organization or participated in community-based projects
Worked with local, national or international social service agencies

To summarize, the independent and dependent variables used for the study are shown in Figure 3.2.

Independent Variables

Institutional Type:
- *Research*
- *Doctoral/Masters*
- *Baccalaureate/Associate*

Market Segment:
- *Name-brand*
- *Core*
- *Convenience*

Discipline:
- *Hard*
- *Soft*

Gender:
- *Male*
- *Female*

Appointment Type:
- *Tenured*
- *Tenure-track*
- *Non-tenure/No tenure*

Dependent (Outcome) Variables

Teaching:
- *Teaching hours per week when classes are in session*
- *Teaching hours per week when classes are not in session*
- *Percent of instruction time for undergraduate programs*
- *Approximate average number of student per undergraduate course*
- *Total number of teaching related activities out of a list of ten activities*

Research:
- *Research hours per week when classes are in session*
- *Research hours per week when classes are not in session*
- *Percent of peer-reviewed publications*
- *Percent of research funding from own institution*
- *Percent of research funding from government entities*
- *Total of scholarly contributions*
- *Total number of research and grant related activities from eight activities*

Service:
- *Service hours per week when classes are in session*
- *Service hours per week when classes are not in session*
- *Administrative hours per week when classes are in session*
- *Administrative hours per week when classes are not in session*
- *Total number of service related activities from nine activities*

Figure 3.2 Diagram of Independent and Dependent Variables

Data Sources

The primary source of data for this study was the Changing Academic Profession (CAP) survey, which was conducted between 2007 and 2008. Initially, the survey was distributed to full-time faculty at four-year institutions across nineteen different countries as a part of a study "to examine the nature and extent of the changes experienced by the academic profession in recent years, drawing in part on comparisons of the current developments with those documented in the first International Survey of the Academic Profession conducted in 1991-1992" (Cumming and Finkelstein, 2012, pp 15). The survey asked faculty about various aspects of their academic life: their general work situation and activities, teaching, research, management (who makes the decisions), career and professional situation, personal background (demographics), and professional preparation.

The U.S. sample for the four-year institutions was a stratified random sample using four strata by size/degree level (large/graduate versus small/undergraduate) and public versus private institutions. A total of 5,772 four-year faculty were sent the survey from 80 four-year institutions. Cummings and Finkelstein reported that approximately 21% of the four-year faculty sample replied to the survey. When compared to the National Study of Postsecondary Faculty 2004, they found that the four-year faculty respondents closely approximated the national faculty population with respect to gender, institutional type, discipline, academic rank, and appointment type. Therefore, their reply rate of 21% was not associated with any significant sample bias.

The same survey was distributed to 1,000 community college full-time faculty in the U.S. A stratified random sample was used to survey a sample drawn based on region

within the U.S. and the size of the college. The result was that 250 community college full-time faculty were represented in the dataset.

The CAP 2007–2008 US weighted database has a total of 1,408 respondents from two-year and four-year institutions in the United States. Fifty-eight of the respondents did not have complete information. The adjusted sample of 1,350 respondents from 154 identified institutions was used for this study.

The distribution of the institutions by the Basic Carnegie Classification reveals that most of the respondents were from either research (32.1%) or associate (30%) institutions. The distribution of the other categories ranged from 12% for doctoral, 19% for master's, and 6.2% for baccalaureate institutions. Therefore, for this study, the institutional types were divided into three categories: research (32.1%), doctoral/masters (31.6%), and baccalaureate/associate (36.2%).

Additional sources of data from the Integrated Postsecondary Education Data System (IPEDS) were utilized for the determination of the market segment in which the faculty work. IPEDS collects information annually through a system of interrelated surveys conducted by the U.S. Department's National Center for Education Statistics (NCES). These are answered by every postsecondary institution that participates in the federal student financial aid program, as mandated by the Higher Education Act of 1965. More than 7,500 institutions complete IPEDS surveys, which cover the following seven areas: institutional characteristics, institutional prices, enrollment, student financial aid, degrees and certificates conferred, student persistence and success, and institutional, human, and fiscal resources. For this study, the IPEDS Data Center

(nces.ed.gov/ipeds/datacenter) final release data was used for institutional characteristics for 2007-2008 for the institutions indicated by the respondents to the CAP Survey:

- Admissions: number of applicants and admitted students for Fall 2007.
- Completion: number of Bachelor or Associates degrees awarded in 2007-08; number of certificates/degree of less than two-years awarded in 2007-08.
- Enrollment: number of Fall 2007 freshmen; full-time undergraduate enrollment Fall 2007; part-time undergraduate enrollment Fall 2007.
- Graduation rates: percent of full-time first time degree completion within 150% normal time; graduated by Fall 2008.

If there was no data for the specific institution available for 2007-2008, then 2008-2009 information was used for the determination of the segment.

Data Analysis

The data analysis for this study was designed to explore the extent that the triumvirate of faculty roles differ with the influence of institution, market segment, discipline, gender, and appointment type. Existing research concerning faculty role performance and achievement has primarily used descriptive or regression techniques to explore the impact of environmental and individual characteristics on faculty work (Blackburn & Lawrence, Clark, Cummings & Finkelstein, Gappa et al., …). While many studies have focused on each aspect of faculty work individually, some have focused on the integrated nature of faculty work (Colbeck, 2002; Bland, et al., 2006). I propose looking at faculty work as a combination of teaching, research, and service. There are

two groups of dependent variables that measure all three of these areas of faculty work: activities and effort given. For each of these groups of dependent variables, a multivariate analysis of variance (MANOVA) was conducted to determine the extent that the combined as well as the individual aspects of faculty work are influenced by institutional type, market segment, discipline, gender, and appointment type. A MANOVA was used to test if the means on a set of dependent variables varied across different levels of a factor. In this study, the MANOVA determined if the average activity or effort given towards faculty work—defined as a combination of teaching, research, and service—varies across institutional type, market segment, gender, and appointment type. The advantage of using the MANOVA is that there is a decreased probability of causing a Type I errors from using a repeated ANOVA to determine the influence on each of the dependent variables separately (Tabachnick & Fiddel, 2007). So, if there is a significant difference in the means of any of the measures of faculty work, it is less likely to be by chance. Before a MANOVA is conducted, several assumptions must be tested.

Distribution of the data. The first part of the analysis was meant to determine if there were sufficient responses for each level of the independent variables for the MANOVA. Therefore, the distribution of faculty for independent variables was explored using frequency tables and cross tabulations to determine if there would be sufficient numbers of respondents in each of the levels of the independent variable. Also, the frequency tables were used to identify if there were any outliers or extreme values within the data, since some of the analyses would be affected by the presence of outliers. If the number of outliers exceeded 5% of the sample, then the measurements for those

individuals were imputed using the average or median of the measures of the variable. This exploration of distribution across the independent variables was part of a general overview of the data from CAP Survey. Next, descriptive statistics for the three areas of faculty work (the dependent variables) of teaching, research, and service were determined.

Correlation of the dependent variables. The next assumption to be tested is that the dependent variables are not highly correlated to each other. While the premise of using the MANOVA is that the dependent variables are related, they should not be highly correlated. Therefore, if the correlation between the dependent variables is between .3 and .8, the combined multivariate analysis of variance can be used for the analysis.

Other assumptions. Other assumptions that need to be checked for the independent variables were normality, outliers, linearity, homogeneity of regression, multicollinearity, and homogeneity of variance-covariance matrices. Given the size of the sample, it should be noted that it is possible that the assumption of the homogeneity of variance-covariance matrices could have been violated since the Box's M test for the homogeneity of covariance matrices was very sensitive, especially since there was a large sample; therefore, individual variance was checked to see if they were within an acceptable range, where the largest variance is less than two times the smallest variance for the groups (Tabachnick & Fidell, 2013).

Multivariate Analysis of Variance. To answer the research questions, there was a series of MANOVAs performed. The first MANOVA was for institutional type and market segment to explore the extent of the two classifications of institution effect and

faculty work. The next MANOVA was for institutional type, market segment, and discipline, which mirrors Clark's "small worlds, different worlds." The next two MANOVA introduced the individual's characteristics (gender and appointment type) as effects on faculty work. Blackburn and Lawrence's theoretical model and previous research on individual influences on faculty work suggests that there may be interaction between individual characteristics and environmental conditions. Therefore, the interaction effects of gender and appointment type with each of the environmental conditions—institutional type, market segment, and discipline—was investigated during the MANOVA.

Pillai's Trace was used to determine if there were significant effects on faculty work at a level of significance of 0.05. If there was a significant effect, the measures of faculty work were individually assessed through either a *t*-test for equality of means or an analysis of variance using a Bonferroni adjusted level of significance of 0.05/number of measures used in the MANOVA. The Games-Howell post hoc for multiple comparisons was used since the sample sizes of the groups was unequal and the variance could not be assumed to be equal across all groups (Fields, 2013).

Limitations

There are a couple of limitation that need to be addressed before proceeding onto the results of the study. The data used were from self-reported information. There are two issues that we need to be aware of with self-reported data, especially in the context of organizational behavior (which is the case here): self-reporting may result in response bias, and "inferences about correlational or causal relationships may be inflated by the

problem of common method variance" (Donaldson and Grant-Vallone, 2002). Given the possibility of the respondents over- or under-reporting their time allocations, activities, or scholarly contributions, the larger the sample size the less likely it is that response bias would be an issue, unless everyone over- or under-reports their activities. As for the issue of common method variance, the only way to test to see if the inferences were not inflated would be to compare the results with prior research or to conduct another method of collecting the data.

The second limitation is the distribution of institutions of the CAP dataset. Since there were only 83 baccalaureate institutions within the sample, it is possible that the faculty from baccalaureate institutions were not representative of all the baccalaureate institutions. Since this study focused on exploring possible market segment differences, the limitation of the number of faculty from baccalaureate institutions also excluded brand-name baccalaureate institutions. Therefore, the interpretation of the results focused on what was available from the CAP dataset, and future studies using the proposed framework will need to use other data sources, which may include more faculty from baccalaureate institutions.

Summary

Based on previous research on faculty work and motivational theories, the theoretical framework presented by Blackburn and Lawrence (1995) provides a model for predicting faculty role performance and achievement. This study focused on the influences of the constructs of environmental conditions, socio-demographic characteristics, and career track on faculty behavior in teaching, research, and service. Data from the CAP Survey 2007-2008, in conjunction with institutional information from

IPEDS, were used to determine if there are differences in activities and effort given toward the triumvirate of faculty work given the environment (institution, market segment, and discipline), gender, and appointment type. The results of the proposed analysis will be presented in the next chapter.

Chapter 4

Results

Introduction

This study sought to identify the relative shaping role of the traditional arbiters of academic work, traditional institutional type, and academic field with the newly-emerging shaping factors identified earlier to include institutional market segments, type of appointment, and gender. For this study, academic work was measured by the activities and hours per week that the faculty reported for teaching, research, and service in the Changing Academic Profession (CAP) 2007-08 Survey.

This chapter starts by reviewing the methodology employed in the analysis to determine how institutional type, market segment, discipline, gender, and appointment type affect faculty work and by identifying the technical assumptions undergirding that analysis that will need to be satisfied. Afterwards, an overview of the survey sample is presented along with the distribution of sample faculty within institutional types, market segments, disciplines, gender, and appointment types. The descriptive statistics for the outcome measures that were used to characterize faculty work for teaching, research, and service will be presented. This basic overview of descriptive statistics will be followed by a presentation of the analytical results organized by research question. Finally, the chapter will conclude with a summary of the significant results of the analysis.

Methodology Summary

Given the theoretical framework that personal and environmental influences will affect what faculty do, the analysis for this study focused on answering the research

questions on the impact of institution type (Carnegie Classification and market segment), disciplinary affiliation (hard versus soft), gender, and appointment type (tenure, tenure-track, non-tenure track/no tenure) on each of the measures of teaching, research, and service work. Using data from the CAP Survey 2007-08, the research questions addressed by this analysis were the following:

RQ1: To what extent do market segments affect faculty work patterns compared to the Carnegie Classification institutional type effect?

RQ2: How does institutional type (Carnegie or market segment) interact with discipline in affecting faculty work patterns?

RQ3: How does gender interact with institutional type (Carnegie or market segment) or discipline in affecting faculty work patterns?

RQ4: How does appointment type influence faculty work in the context of institutional type (Carnegie or market segment) and discipline?

There were four independent variables: institution type, discipline, gender, and appointment type. Since almost all the research on faculty work uses the Carnegie Classification for institutional type, the benchmark for institutional type was based on the Basic Carnegie Classification, which divides the institutions into Research, Doctoral, Masters, Baccalaureate, Associate, and Special Focus. For this analysis, the classification was modified to include three types: research, doctoral/master's, and baccalaureate/associate. Also, this study was focused on undergraduate education, so institutions classified as Special Focus were not included. Zemsky et al. (1997) developed another way to classify institutions by creating market segments based on

demand (applications versus admissions), percentage of full-time and part-time students, and degrees awarded. The three general market segments—name-brand, core, and convenience–were used for the analysis. Discipline was divided into two categories—hard and soft—following the definition proposed by Biglan's classification of disciplines (Becher and Trowler, 2001). Gender was also one of the independent variables and was defined as male or female. In the CAP Survey 2007-08, faculty were asked about their contract with their institution among five categories: permanently employed (tenured), continuously employed (no preset term, but no guarantee of permanence), fixed-term employment with permanent/continuous employment prospects (tenure-track), fixed-term employment without permanent/continuous employment prospects (non-tenure eligible), and other (please specify). Because of the large number of tenured and continuously employed faculty, the appointment types were grouped into three categories: tenured, tenure-track, and non-tenure/no tenure. The faculty that indicated they were continuously employed were placed into the no tenure category since there was no guarantee of permanence, which is similar to a non-tenure eligible contract.

The measures for faculty work were divided into three sets of dependent variables: teaching, research, and service. There were five measures for teaching used: teaching hours per week when classes are in session; teaching hours per week when classes are not in session; percent of instruction time for undergraduate programs; approximate average number of students per undergraduate course; and a summative scale of ten teaching-related activities. Teaching hours per week included preparation of instructional materials and lesson plans, classroom instruction, advising students, and reading and evaluating student work.

There were seven measures for research used: research hours per week when classes are in session; research hours per week when classes are not in session; percent of peer-reviewed publications; percent of research funding from own institution; percent of research funding from government entities; total scholarly contributions (logarithmic transformed); and a summative scale of eight research- and grant-related activities from a series of yes/no statements. Research hours per week included reading literature, writing, conducting research, and fieldwork.

There were five measures for service used: service hours per week when classes are in session; service hours per week when classes are not in session; administration hours per week when classes are in session; administration hours per week when classes are not in session; and a sum of nine service-related activities indicated by the respondent. Service hours per week was associated with services to clients and/or patients, unpaid consulting, and public or voluntary services, whereas administration hours per week was associated with committees, department meetings, and paperwork.

The analytic tool used to answer the research questions was a series of multivariate analyses of variance on each set of measures for faculty work (teaching, research, and service, separately) to test the influence of institutional type, market segment, discipline, gender, and appointment type. The assumptions for sample size, normality, outliers, linearity, homogeneity of variance and covariance matrices, multicollinearity, and singularity were checked for each of the three sets of measures of faculty work. The multivariate effects and interactions for each set of measures of faculty work were tested using Pillai's Trace since this is a robust measure when the sample sizes are different, which was true for some of the independent variables. If

Pillai's Trace was significant at $\alpha = 0.05$, the effects on the individual measures were examined. The *t*-test for independent samples were used for gender and discipline to examine differences in the measures between the two groups. Analysis of variance for institutional type, market segment, and appointment type was used, along with post hoc pairwise comparisons to examine the differences between the two groups. For the multiple comparisons, a Bonferroni adjustment was used as 0.05/n, where *n* is the number of measures for that set of faculty work.

Distribution of Sample by Independent Variables

The study used the results from the United States component of the Changing Academic Professions (CAP) Survey 2007-08. The data collected by the U.S. CAP Survey 2007-08 included two separate samples, with the first from four-year institutions and the second from two-year institutions. The first round of the survey was collected through a stratified random sample with the four strata of four-year colleges and universities (large/graduate, small/undergraduate, public, and private). The total number of surveys sent was 5,772 faculty at 80 four-year colleges and universities. The second round of the survey was from a sample of 1,000 public two-year colleges collected through a stratified random sample based on accreditation regions (Northeast, Southeast, Midwest, Southwest, and West). The CAP U.S. weighted database has a total of 1,408 respondents from two-year and four-year institutions in the United States. The total number of respondents was 1,350 from 154 identified institutions (58 respondents had incomplete information).

The data from the CAP Survey was indexed by institutional name and identification number (uid) from the Integrated Postsecondary Education Data System

(IPEDS). Faculty who indicated an institutional name that did not correspond directly to a name listed in IPEDS or was from an institution listed as graduate only, special focus, or not in the Carnegie universe were excluded from the data set, which reduced the total to 1,332 respondents from 154 institutions.

This subset of the data was categorized into three market segments (name-brand, core, and convenience) using the criteria set forth by Zemsky et al. (2007) based on admissions, graduation rates, and full-time/part-time status of the undergraduate students attending the institutions in 2007-08. The distribution of faculty by market segment resulted in 20.7% of the faculty being from the name-brand segment, 35.9% from the core segment, and 43.3% from the convenience segment. There were 26 faculty (2%) excluded from the market segments because of their not specifying the name of the institution at which they worked (see Table 4.1).

Faculty were also divided by their disciplinary affiliation for their primary academic unit (department) between hard discipline and soft discipline. The distribution of hard or soft discipline of the primary academic unit was split between 58.9% in the soft disciplines and 37.5% in the hard disciplines. The distribution of gender, also displayed in Table 4.1, shows that, of the 1,281 faculty that indicated their gender, 61% were male and 39% were female.

The distribution of appointment type indicated by the duration of current employment contract shows 57.7% being tenured, 20.8% being tenure-track, 13.2% being non-tenure track, and 8% being in positions that are non-tenure eligible. Since the distribution of the appointment types was not evenly divided, the appointment type categories were modified to three appointment types: tenured, tenure-track, and non-

tenure/no tenure. This division matches the characterization of faculty appointment type used by Bland et al. (2006). in their study of the effects of appointment type on faculty productivity. The distribution of appointment type was 54.6% tenured, 19.5% tenure-track, and 20.6% non-tenure/no tenure (see Table 4.1)

The distribution of institutional type within market segments is consistent with the premise that Baccalaureate and Associate institutions would dominate the convenience market segment (83.4%) and be reflected somewhat within the core market segment (16.6%), but would not be represented within the name-brand market segment. Doctoral and Master's institutions were distributed among all three market segments, with the majority in the core market segment (50.4%) and the remainder divided between the name-brand (23%) and convenience (26.6%) market segments. Research institutions were distributed primarily in the name-brand (41.4%) and core (43.9%) segments, with the remainder within the convenience (14.7%) market segment (see Table 4.2).

The distribution of hard and soft disciplines among the institutional types was consistent with the overall distribution of disciplines, with approximately 60% within soft disciplines and 40% within hard disciplines. The percent of male faculty in research and doctoral/masters institutions was about 60%, whereas male faculty composed about 50% of faculty within baccalaureate/associative institutions. There was also some variation in the distribution of appointment type among the institutional types when comparing the baccalaureate/associate with the research and doctoral/master's institutions. Within baccalaureate/associate institutions, there were 30.5% either non-tenure or no tenure appointments versus approximately 17% in research and doctoral/master's institutions. There were, overall, more tenured faculty at research institutions (64.1%) versus

doctoral/masters (55.7%) and baccalaureate/associate (53.4%) institutions. There were more tenure-track faculty in doctoral/master's (27.8%) than in research (18.6%) or baccalaureate/associate (16.1%) institutions (see Table 4.2) The overall distribution of faculty discipline, gender, and appointment type by market segment were very similar to the distribution by institutional type (see Table 4.3).

The distribution of faculty gender and appointment type by discipline and appointment type by gender was also checked. In the hard disciplines, there were more male faculty (60.7%) than female faculty, whereas, for the soft disciplines, the proportion of males to females was closer, with 53% male and 47% female. While most of the faculty were tenured, the distribution of appointment type for male and female faculty was similar. There were more male tenured faculty (61.6%) than female tenured faculty (53.1%), whereas, for non-tenure/no tenured faculty, there were more female faculty (25.1%) than male faculty (18.7%). The difference between male and female tenure-track faculty was not as large, with 19.7% for male faculty and 21.8% for female faculty (see Table 4.4.).

Table 4.1

Distribution of faculty by institutional type, market segment, discipline, gender, and appointment type (N=1332)

	N	Percent
Carnegie Classification Basic 2005		
Research	428	32.1
Doctoral/Masters	421	
Doctoral	163	12.2
Masters	258	19.4
Baccalaureate/Associate	483	
Baccalaureate	83	6.2
Associate	400	30.0
Market Segments (3 general segments)		
Name Brand	268	20.1
Core	467	35.1
Convenience	571	42.9
Total	1306	98.1
Excluded (No institution named)	26	2.0
Discipline (primary academic unit)		
Soft discipline	784	58.9
Hard discipline	499	37.5
Total	1283	96.3
Did not indicate discipline	49	3.7
Gender		
Male	714	53.6
Female	567	42.6

Total	1281	96.2
Missing	51	3.8
Appointment Type (3 categories)		
Tenured	727	54.6
Tenure-track	260	19.5
Non-tenure/No tenure	275	
Non-tenure	107	8.0
No tenure	168	12.6
Total	1262	94.7
Other/ Did not indicate employment status	70	5.3

Table 4.2

Distribution of faculty within market segments, discipline, gender, and appointment type by institutional type

	Carnegie Classification - 3 categories							
	Research		Doctoral/Masters		Baccalaureate/ Associate		Total	
	N	Percent	N	Percent	N	Percent	N	Percent
All Institutions	428	32.1	421	31.6	438	36.2	1332	
Market Segments								
Name Brand	177	41.4	91	23.0	0	0.0	268	20.5
Core	188	43.9	199	50.4	80	16.6	467	35.8
Convenience	63	14.7	105	26.6	403	83.4	571	43.7
Total	428		395		483		1306	
Discipline								
Soft discipline	247	58.8	251	62.0	286	62.4	784	61.1
Hard discipline	173	41.2	154	38.0	172	37.6	499	38.9
Total	420		405		458		1283	
Gender								
Male	247	60.0	236	58.4	231	49.7	714	55.7
Female	165	40.0	168	41.6	234	50.3	567	44.3
Total	412		404		465		1281	
Appointment Type								
Tenured	262	64.1	223	55.8	242	53.4	727	57.6
Tenure-track	76	18.6	111	27.8	73	16.1	260	20.6
Non-tenure/ No tenure	71	17.4	66	16.5	138	30.5	275	21.8
Total	409		400		453		1262	

Table 4.3

Distribution of faculty discipline, gender, and appointment type by market segment

	Market Segments						Total	
	Name Brand		Core		Convenience			
	N	Percent	N	Percent	N	Percent	N	Percent
Discipline								
Soft discipline	156	59.5	284	63.4	334	60.8	774	61.5
Hard discipline	106	40.5	164	36.6	215	39.2	485	38.5
Total	262		448		549		1259	
Gender								
Male	161	62.9	240	53.1	297	54.2	698	55.6
Female	95	37.1	212	46.9	251	45.8	558	44.4
Total	256		452		548		1256	
Appointment Type								
Tenured	147	58.6	261	58.1	304	56.6	712	57.6
Tenure-track	61	24.3	89	19.8	102	19.0	252	20.4
Non-tenure/ No tenure	43	17.1	99	22.0	131	24.4	273	22.1
Total	251		449		537		1237	

Table 4.4

Distribution of faculty gender and appointment type by discipline and appointment type by gender

	Discipline					
	Soft discipline		Hard discipline		Total	
	N	Percent	N	Percent	N	Percent
Gender						
Male	401	53.0	289	60.7	690	56.0
Female	355	47.0	187	39.3	542	44.0
Total	756		476		1232	
Appointment Type						
Tenured	421	56.5	282	60.1	703	57.9
Tenure-track	167	22.4	86	18.3	253	20.8
Non-tenure/ No tenure	157	21.1	101	21.5	258	21.3
Total	745		469		1214	

	Male		Female		Total	
	N	Percent	N	Percent	N	Percent
Appointment Type						
Tenured	431	61.6	292	53.1	723	57.8
Tenure-track	138	19.7	120	21.8	258	20.6
Non-tenure/ No tenure	131	18.7	138	25.1	269	21.5
Total	700		550		1250	

Descriptive Statistics of Measures of Faculty Work

The following gives the overall picture of the faculty that participated in the CAP Survey 2007-08 in terms of the following measures of faculty work: teaching, research, and service.

Teaching. Teaching activities and effort are measured by five questions on the CAP Survey: teaching hours per week when classes are in session; teaching hours per week when classes are not in session; average number of undergraduate students per course; percentage of instruction time spent on undergraduate programs; and a summative scale of ten teaching activities. Faculty taught, on average, 23.15 (*SD* = 12.49) hours per week when classes were in session and an average of 6.91 (*SD* = 6.85) hours per week when classes were not in session. There was one faculty member who indicated 80 hours per week for teaching when classes are in session, but most faculty were within a couple of hours from the average. Approximately 66% (*SD* = 37.32) of the instructional time was devoted to undergraduate programs with approximately 34 (*SD* = 41.87) undergraduate students per course. There was a group of faculty with large numbers of undergraduate students per course, ranging from 100–600, while most faculty were below 50. Out of the ten teaching activities, the faculty indicated, on average, seven (*SD* = 1.75) (see Table 4.5).

The summative scale of ten teaching-related activities was created from a series of yes/no statements summarized in Table 4.6. Only 1,294 of the faculty indicated at least one of the ten teaching activities. The activities that most of the faculty indicated were classroom instruction and lecturing (99.1%), electronic communications (e-mail) with students (94.7%), face-to-face interaction with students outside of class (92.5%),

development of course material (87.8%), and individualized instruction (81.1%). The activities that faculty were least likely to engage in were ICT-based learning/computer-assisted learning (28.5%) and distance education (29.8%).

The correlation between all of the teaching variables was checked to determine if all of the teaching measures would be linearly related to each other. Four out of the five measures for teaching were significantly correlated with each other. The average number of undergraduates per course was only significantly correlated to percent of undergraduate instruction time; therefore, the average number of undergraduate students was not used for the subsequent analysis related to the research questions (see Appendix Table C.1).

Table 4.5

Descriptive statistics for measurements for teaching aspect of faculty work

	N	Range	Mean	SD
Teaching hours per week when classes are in session*	1294	0 - 80	23.15	12.49
Teaching hours per week when classes are not in session*	1332	0 - 60	6.91	6.85
Percent of undergraduate instruction time	1294	0 - 100	66.47	37.32
Average number of undergraduates per course	1219	0 - 600	34.29	41.87
Total teaching activities	1294	1 - 10	6.86	1.75

* Teaching included preparation of instructional materials and lesson plans, classroom instruction, advising students, reading and evaluating student work.

Table 4.6

Total teaching activities[a] reported by faculty

	Affirmative Responses		Percent of Faculty (N=1294)
	N	Percent	
Classroom instruction/lecturing	1283	14.5	99.1
Individualized instruction	1049	11.8	81.1
Learning in projects/project groups	718	8.1	55.5
Practice instruction/laboratory work	520	5.9	40.2
ICT-based learning/computer-assisted learning	369	4.2	28.5
Distance education	385	4.3	29.8
Development of course material	1136	12.8	87.8
Curriculum/program development	989	11.1	76.4
Face-to-face interaction with students outside of class	1197	13.5	92.5
Electronic communications (e-mail) with students	1225	13.8	94.7
Total	8871	100.0	685.5

a. Dichotomy group tabulated at value 1.

Research. Research activities and effort included hours/week towards research, total number of scholarly contributions in the past three years, percent of peer-reviewed publications, grant-funded research by sources of funding, and a sum of research/grant-related activities.

Research hours per week included reading literature, writing, conducting research, and field work. Faculty averaged 11.26 research hours per week when classes were in

session compared to 19.02 research hours per week when classes were not in session. Approximately 54% of faculty's publications were peer-reviewed. Percentage of funding for research was, on average, 42% from their own institution and 28% from government entities (see Table 4.7).

The summative scale of eight research- and grant-related activities was from a series of yes/no statements summarized in Table 4.8. There were only 974 faculty who answered the questions about research- and grant-related activities, and 98% of those faculty responded that they did engage in at least one of the research- or grant-related activities. The majority (80%) of the faculty indicated that they wrote academic papers that contain research results or findings. The activity least likely to be indicated was technology transfer (5.2% of affirmative responses and 17.2% of faculty). Faculty, on average, engaged in three out of the seven research- and grant-related activities (see Table 4.8).

Faculty were also asked to indicate their number of scholarly products within the past three years. Table 4.9 summarizes the scholarly contributions that faculty indicated in the CAP Survey. Approximately 75% of the faculty indicated an average of six papers presented at a scholarly conference. There was a collection of extraordinary faculty that indicated values that were extreme outliers compared to the other faculty. One person indicated presenting 250 papers at a scholarly conference in the past three years and another that indicated 500 professional articles written for a newspaper or magazine. A third person indicated 500 artistic works performed or exhibited. A summative scale was created by using the 11 scholarly products and if they indicated that they did not have any scholarly contributions. Since these contributions have different time requirements to

complete and disciplinary differences, a logarithmic transformation was applied to the scale to adjust to the skewness of the overall distribution. Bland et al. (2006) used a similar summative scale for total scholarly contributions and also used the logarithmic transformation of total scholarly contributions for their analysis of research productivity.

The correlation between the measures of research and granted-related effort and activities was assessed to see if they were all linearly correlated to each other. Almost all of the measures of research work were significantly correlated to each other, with the exception of the percent of the funding for research coming from one's own institution, which was not significantly correlated to research hours per week nor percent of peer-reviewed publications (see Appendix Table C.2).

Table 4.7

Descriptive statistics for the measures of research work

	N	Range	Mean	SD
Research hours per week when classes are in session*	1294	0 - 65	11.26	10.17
Research hours per week when classes are not in session*	1332	0 - 80	19.02	14.88
Percent of Peer-reviewed publications	944	0 - 100	53.64	45.31
Percent of the funding for your research came from own institution	904	0 - 100	42.14	39.68
Percent of the funding for your research came from government entities	683	0 - 100	28.17	38.17
Research and grant related activities	974	1 - 7	3.34	1.96
Total of scholarly contributions in the past three years	1129	0 - 501	14.10	27.82
Logarithmic transformed Scholarly Contributions**	1129	0 - 6.22	2.20	0.97

* Research includes reading literature, writing, conducting research, fieldwork
** One was added to all of the scholarly contributions before the logarithmic transformation.

Table 4.8

Distribution of research and grant related activities[a]

	Affirmative Responses		Percent of Faculty (N = 974)
	N	Percent	
Preparing and conducting experiments, inquiries etc.	484	14.9	49.7
Supervising a research team or graduate research assistants	463	14.2	47.5
Writing academic papers that contain research results or findings	780	24.0	80.1
Technology transfer	168	5.2	17.2
Answering calls for proposals or writing research grants	575	17.7	59.0
Managing research contracts and budgets	336	10.3	34.5
Purchasing or selecting equipment and research supplies	382	11.8	39.2
None of the above	63	1.9	6.5
Total	3251	100.0	333.8

a. Dichotomy group tabulated at value 1.

Table 4.9

Summary of total scholarly contributions of faculty in the past three years

	N	Maximum	Mean	SD
Total of scholarly contributions in the past three years	1129	501	14.10	27.82
Scholarly books you authored or co-authored	760	8	0.34	0.70
Scholarly books you edited or co-edited	749	20	0.39	1.38
Articles or chapters published in an academic book or journal	944	90	4.62	7.58
Research report/monograph written for a funded project	788	51	1.64	4.27
Paper presented at a scholarly conference	1008	250	5.98	11.94
Professional article written for a newspaper or magazine	798	500	1.84	17.94
Patent secured on a process or invention	716	12	0.11	0.65
Computer program written for public use	716	10	0.15	0.66
Artistic work performed or exhibited	770	500	2.42	19.01
Video or film produced	724	24	0.25	1.37
Others	501	300	2.54	16.44

(Number completed in the past three years)

Service. Service effort and activities were measured by hours/week toward services to clients and/or patients, unpaid consulting, public or voluntary services, administration (committees, department meetings, and paperwork), and a sum of service-related activities indicated by the respondent. The nine service-related activities are listed in Table 4.10. Of the respondents, 85% indicated that they did at least two listed service activities. The two service-related activities indicated the most were serving as a peer reviewer (58.5%) and serving as a member of a community organization or participating in community-based projects (49.6%).

Table 4.11 displays the descriptive statistics for the five measures of service effort and activities. Faculty reported between 4–5 hours per week for service, including service to clients and/or patients, unpaid consulting, public, and voluntary services. Faculty administration hours per week included committees, department meetings, and paperwork and varied from an average of 7.24 hours per week when classes were in session to 5.4 hours per week when classes were not in session. Most faculty indicated between 0 to 10 hours per week towards service-related activities.

All five of the measures of service work were significantly correlated to each other, as shown in Appendix Table C.3. Therefore, all of the measures were used in the analysis.

Table 4.10

Service related activities[a] indicated by faculty

	Affirmative Responses		Percent of Faculty (N=1283)
	N	Percent	
Served as a member of national/international scientific committees/boards/bodies	320	10.8	24.9
Served as a peer reviewer (e.g. for journals, research sponsors, institutional evaluations)	751	25.3	58.5
Served as an editor of journals/book series	225	7.6	17.5
Served as an elected officer or leader in professional/academic associations	321	10.8	25.0
Served as an elected officer or leader of unions	36	1.2	2.8
Participated in local, national or international politics	186	6.3	14.5
Served as a member of a community organization or participated in community-based projects	636	21.5	49.6
Worked with local, national or international social service agencies	256	8.6	20.0
Other (please specify)	65	2.2	5.1
None of the above	167	5.6	13.0
Total	2963	100.0	230.9

a. Dichotomy group tabulated at value 1.

Table 4.11

Descriptive statistics for measures of faculty service work

	N	Maximum	Mean	SD
Service hours per week when classes are in session*	1294	50	4.34	5.42
Service hours per week when classes are not in session*	1332	75	4.78	6.52
Administration hours per week when classes are in session**	1294	60	7.24	7.35
Administration hours per week when classes are not in session**	1332	60	5.4	8.03
Service related activities	1283	8	2.17	1.54

* Includes services to clients and/or patients, unpaid consulting, public or voluntary services

** Included committees, department meetings, paperwork

Inferential Analysis of Influences on Faculty Work through MANOVA

To determine if there were significant effects from institutional type, market segments, discipline, gender, and appointment type, a series of multivariate analysis of variance (MANOVA) was conducted for each set of the measures of faculty work: teaching, research, and service. For the analysis, only the measures that were significantly intercorrelated were used. The four measures of teaching used were teaching hours per week when classes are in session, teaching hours per week when classes are not in session, percent of undergraduate instruction time, and total teaching activities. The six measures of research used were research hours per week when classes

are in session, research hours per week when classes are not in session, percent of peer-reviewed publications, percent of research funding from government entities, total research- and grant-related activities, and total scholarly contributions (logarithmic transformed). The five measures of service used were service hours per week when classes are in session, service hours per week when classes are not in session, administration hours per week when classes are in session, administration hours per week when classes are not in session, and total service related activities.

For the following analyses, the assumptions of normality, outliers, linearity, multicollinearity, singularity, and homogeneity of variance-covariance matrices were checked. The only assumption that was violated was the homogeneity of variance-covariance matrices. This was due to the fact that Box's M test, used for the homogeneity of covariance matrices, is very sensitive, especially when there is a large sample size; therefore, the individual variances were checked and were found to be within acceptable range (Tabachnick & Fidell, 2013). Pillai's Trace was used to determine if there were significant effects on faculty work at a level of significance of 0.05. If there was a significant effect, the measures of faculty work were individually assessed through an analysis of variance using a Bonferroni-adjusted level of significance of 0.05/number of measures used in the MANOVA. The Games-Howell post hoc for multiple comparisons was used since the sample sizes of the groups was unequal and the variance could not be assumed to be equal across all groups (Fields, 2013). The following are the results presented in the order of the research questions for this study.

Research question 1. To what extent do market segments affect faculty work patterns independent of institutional type (Carnegie classification)? A multivariate analysis of variance was performed to investigate the extent to which institutional type affects faculty work patterns. The analysis was broken into three sections, each corresponding to the triumvirate of faculty work: teaching, research, and service. For each arena of faculty work, the effects of institutional types (Research, Doctoral/Masters, and Baccalaureate/Associate) and market segments (Name-brand, Core, and Convenience) were evaluated.

Teaching. A one-way multivariate analysis of variance was conducted on the combination of the four measures for teaching effort and activities: teaching hours/week (in session), teaching hours/week (not in session), total teaching activities, and percent of undergraduate instruction time. There was a significant effect by the institutional types (Carnegie) on a linear combination of the teaching variables using Pillai's, T=0.06; F(8, 2578) = 10.01, $p < 0.001$, partial $\eta^2 = 0.03$. All four of the teaching variables were significantly affected by the institutional types.

Teaching hours per week when classes are in session were higher for Baccalaureate/ Associate (M = 25.87, SE = 0.57) compared to both Research (M = 20.46, SE = 0.61) and Doctoral/Masters (M = 22.69, SE = 0.60) institutions. Institutional types were significantly different for teaching hours/week when classes are not in session, with Baccalaureate/Associate (M=7.87, SE = 0.31) slightly higher than Research (M=6.22, SE = 0.34). Percent of time on undergraduate instruction was, on average, 12.67% higher for Doctoral/Master's (M = 68.94, SE = 1.8) compared to Research (M = 56. 27, SE = 1.82). Percent of time on undergraduate instruction was also significantly higher for

Baccalaureate/Associate (M= 73.13, SE = 1.69) compared to Research, but it did not significantly differ from Doctoral/Masters. Total teaching activities were significantly different, with Baccalaureate/Associate institutions (M = 7.06, SE = 0.08) being slightly higher than Research (M = 6.66, SE = 0.086) (see Appendix Table C.4 and Table C.5.)

The next analysis was conducted to determine if there were significant differences in teaching effort and activities across the three market segments. The results of the multivariate analysis of variance for the effect of market segment on the combination of the teaching variables yielded a significant difference for teaching among the three market segments, Pillai's T = 0.027, $F(8, 2528) = 4.32$, $p < 0.001$, partial $\eta^2 = 0.013$; therefore, the four teaching variables were considered separately.

All four of the teaching measures were significantly affected by market segment. Faculty in the convenience market segment, on average, spent 2.36 more hours per week teaching when classes were in session compared to faculty in the core market segment. There was no significant difference in teaching hours per week when classes were in session between the name-brand and core or between the name-brand and convenience market segments. There was a significant difference between convenience and name-brand market segments for teaching hours/week when classes were not in session (MD = 1.62, SE = 0.467, p = 0.002), with convenience being, on average, 1.62 hours per week higher than name-brand. The percent of undergraduate instruction time was significantly higher, by 8.52%, for the convenience market segment (M = 71.53, SE = 1.572) compared to core market segment (M = 62.95, SE = 1.74). Comparing name-brand to core or to convenience did not yield any significant difference in the percent of time devoted to undergraduate instruction. For total teaching activities, the only significant

difference was between the convenience (M = 6.95, SE = 0.07) and name-brand market segments (M = 6.57, SE = 0.11) (see Appendix Table C.6 and Table C.7).

Research. The results of the one-way multivariate analysis of variance to test the effect of institutional type on the combination of six research variables was significant using Pillai's Trace, T = 0.07, $F(14, 1018) = 2.66$, p = .001, partial η^2 = 0.03. The only research variable that was significantly different among the institutional types was the percent of peer-reviewed publications ($F(2, 549) = 11.99$, $p < .001$, partial $\eta^2 = 0.04$). Faculty from research institutions (M = 66.04, SE = 3.05) were, on average, 21.97% higher than faculty from baccalaureate/associate institutions (M=44.08, SE = 3.67) using a Bonferroni adjusted level of significance of 0.008 (see Appendix Table C.8, Table C.9, and Table C.10).

The multivariate analysis of variance conducted for testing the effect of market segment on the combination of six research variables indicated that there was no significant effect using Pillai's Trace, T = 0.02, $F(12, 1082) = 1.04$, p = .409. The univariate analysis of variance for each of the research variables among the market segments also resulted in no significant effect.

Service. Institutional type showed a significant effect on the combination of the five service variables using Pillai's Trace from the multivariate analysis of variance (T = 0.02, $F(10, 2478) = 2.365$, p = 0.009, partial η^2 = 0.009). Institutional type was found to be significantly different across two service variables when the follow-up analysis of variance was conducted on the individual service variables using the Bonferroni adjusted level of significance of 0.01. Service hours per week when classes were in session was significant, $F(2, 1242) = 5.15$, p = 0.006, partial η^2 = 0.008. When looking at multiple

comparisons, none of the institutional types was significantly different at the 0.01 level of significance (see Appendix Table C.11 and Table C.12).

There was a significant difference among the institutional types for service-related activities, $F(2, 1242) = 5.00$, $p = 0.007$, partial $\eta^2 = 0.008$. Research faculty ($M = 2.32$, $SE = 0.08$) indicated, on average, a slightly higher number of service-related activities than the faculty at baccalaureate/associate institutions ($M = 2.00$, $SE = 0.07$). There was no significant difference between the faculty at doctoral/master's institutions ($M = 2.22$, $SE = 0.08$) since their average was within the range of the research and baccalaureate/associate faculty (see Appendix Table C.11 and Table C.12).

The multivariate analysis of variance conducted to determine the effect of market segment on the combined service variables was significant ($T = 0.02$, $F(10, 2430) = 1.96$, $p = 0.034$, partial $\eta^2 = 0.01$). When the analysis of variance was conducted on the individual service variables, administration hours (which included committees, department meetings, paperwork) per week when classes were in session ($F(2, 1218) = 5.45$, $p = 0.004$, partial $\eta^2 = 0.009$) was the only single measure of service that was significantly different due to the market segments. Faculty in the core market segment varied significantly from faculty in the convenience market segment. Faculty in the core market segment spent, on average, 8.05 hours per week ($SE = 0.35$) on administrative service, whereas faculty in the convenience market segment reported, on average, 6.55 hours per week ($SE = 0.32$). There was no significant difference between name-brand segment faculty ($M = 7.68$, $SE = 0.47$) and core segment faculty or convenience segment faculty (see Appendix Table C.13 and Table C.14).

Research question 2. How does institutional type (Carnegie Classification or market segment) interact with discipline in affecting faculty work patterns? The disciplines were divided into two groups—hard and soft—related to the nature of the discipline. The CAP Survey asked faculty about their discipline for their highest degree earned, the discipline of their department, and the discipline of their teaching. For this analysis, the discipline of their department was used. A two-way multivariate analysis of variance was preformed to investigate the extent to which the discipline's interaction with institutional type and market segments affect faculty work patterns. The analysis was broken up into three sections corresponding to the triumvirate of faculty work: teaching, research, and service.

Teaching. A series of two-way multivariate analyses of variance was performed to test if there was an effect on teaching effort and activities by discipline of the faculty's department, the interaction of discipline with institutional type, and the interaction of discipline with market segment. The measures for teaching effort and activities used were teaching hours/week (in session), teaching hours/week (not in session), total teaching activities, and percent of undergraduate instruction time. There was a significant discipline effect on the combination of the four teaching measures, Pillai's T = 0.02, $F(4, 1238) = 7.10$, $p < 0.001$, partial $\eta^2 = 0.022$. The teaching variables were considered separately and tested for the effect of discipline on the individual teaching measures. Teaching hours per week when classes were in session, for soft disciplines ($M = 24.21$, $SD = 12.27$), were significantly higher than for hard disciplines ($M = 21.37$, $SD = 12.49$). Percent of undergraduate instruction time was also significantly higher for soft

disciplines (M = 69.36, SD = 38.28) compared to hard disciplines (M = 62.65, SD = 36.18). On the other hand, the other two teaching measures were not significantly different between hard and soft disciplines using the Bonferroni adjusted level of significance of 0.0125 (see Appendix Table C.15).

There was no significant interaction effect of discipline with institutional type on the combined teaching variables, Pillai's T = 0.01, $F(8, 2478) = 1.12$, p =0.349. There was also no significant interaction effect of discipline with market segments on the combined teaching variables, Pillai's T = 0.01, $F(8, 2432) = 0.71$, p=0.682. When looking at the individual teaching measures, there were no interaction effects for either discipline with institutional type or discipline with market segments.

Research. Using the six research variables, a series of two-way multivariate analyses of variance was conducted to determine if discipline and its interaction with institutional type or market segment had a significant effect on the combination of research- and grant related-effort and activities. Using Pillai's Trace, it was determined that there was a significant effect by discipline, $T = 0.34$, $F(6, 541) = 46.22$, $p < 0.001$, partial $\eta^2 = 0.336$. Five of six research measures were significantly different between hard and soft disciplines at the Bonferroni adjusted level of significance of 0.008 (see Appendix Table C.16).

Research hours per week when classes were in session for faculty in hard disciplines (M = 12.56, SD = 11.83) averaged 3.21 hours more than faculty in soft disciplines (M = 10.65, SD = 9.03). Research hours per week when classes were not in session was not significantly different between soft and hard disciplines. Percent of peer-reviewed publications was, on average, higher for faculty in the hard disciplines (M =

63.48, *SD* = 43.96) than in soft disciplines (*M* = 48.33, *SD* = 45.10). Of the percentage of funding for research from governmental entities, the faculty from the hard disciplines reported, on average, a substantially higher percentage (*M* = 47.66, *SD* = 39.62) than those in the soft disciplines (*M* = 13.27, *SD* = 29.51). Total research- and grant-related activities were also reported to be higher for faculty in the hard disciplines (*M* = 4.59, *SD* = 1.93) than in the soft disciplines (*M* = 2.64, *SD* =1.58). The scholarly contributions were significantly higher for faculty in the hard disciplines than the soft disciplines as well, with faculty in the hard disciplines reporting, on average, 17.46 items within the past three years versus faculty in soft disciplines, who averaged 12.32 items (see Appendix Table C.16).

There was no significant interaction effect of discipline with institutional type on the combined research measures, Pillai's Trace = 0.02, $F(12, 1084) = 0.85$, $p = .598$. Likewise, there was no significant interaction effect of discipline with market segment on the combination of the research variables, Pillai's Trace = 0.03, $F(12, 1050) = 1.32$, $p = 0.20$. For both discipline with institutional type and discipline with market segment, there were no interaction effects on the individual research variables.

Service. A series of two-way multivariate analyses of variance was conducted to test the effect of discipline and its interaction with institution type and market segments on the combination of the five service-related variables. There was a significant effect of discipline on the combined service measures, Pillai's T = 0.024, $F(5, 1188) = 5.83$, $p < 0.001$, partial $\eta^2 = 0.024$. When testing the effect of discipline on the individual service measures, three out of the five measures were significantly different between soft and hard disciplines using a Bonferroni adjusted level of significance of 0.01. Service hours

per week when classes were in session was significantly higher for faculty in the hard disciplines (M = 5.12, SD = 6.87) than in soft disciplines (M = 3.91, SD = 4.28). Service hours per week when classes were not in session were also significantly higher for faculty in the hard disciplines (M = 5.65, SD = 7.44) than in the soft disciplines (M = 4.30, SD = 5.88). Administration hours per week when classes were in session was not significantly different between the hard and soft disciplines, but administration hours per week when classes were not in session was significantly different, with faculty in the hard disciplines reporting, on average, 2.45 more hours per week than faculty in the soft disciplines. There was no significant difference between the disciplines for total service-related activities (see Appendix Table C.17).

There was no interaction effect of institutional type and discipline on the combination of service-related variables using Pillai's Trace in the multivariate analysis of variance (T = 0.02, F(10, 2378) = 1.76, p = 0.062, partial η^2 = 0.007). When looking at the service measures individually, there was only one significant interaction effect of institutional type and discipline, which was service hours per week when classes are in session, F(2, 1192) =5.72, p=0.003, partial η^2 = 0.01 (see Appendix Table C.18). Figure 4.1 displays how the interaction between discipline and institutional type effects the average service hours per week. Faculty in the hard disciplines at research institutions were significantly, on average higher (M = 6.567, SE = 0.432), than the rest of the faculty in the hard disciplines at Doctoral/Masters (M = 4.64, SE = 0.46) and Baccalaureate/Associate (M = 4.510, SE = 0.435) institution as well as the faculty in the soft disciplines in all three of the institutional types: Research (M = 3.819, SE – 0.36),

Doctoral/Masters (*M* = 4.59, *SE* = .347), and Baccalaureate/Associate (*M* – 3.395, *SE* = 0.326).

There was no interaction effect of market segment and discipline on the combination of service-related variables using Pillai's Trace in the multivariate analysis of variance (*T* = 0.01, *F*(10, 2334) = 1.14, *p* = 0.325). There was also no significant interaction effect of discipline with market segment on the individual service measures.

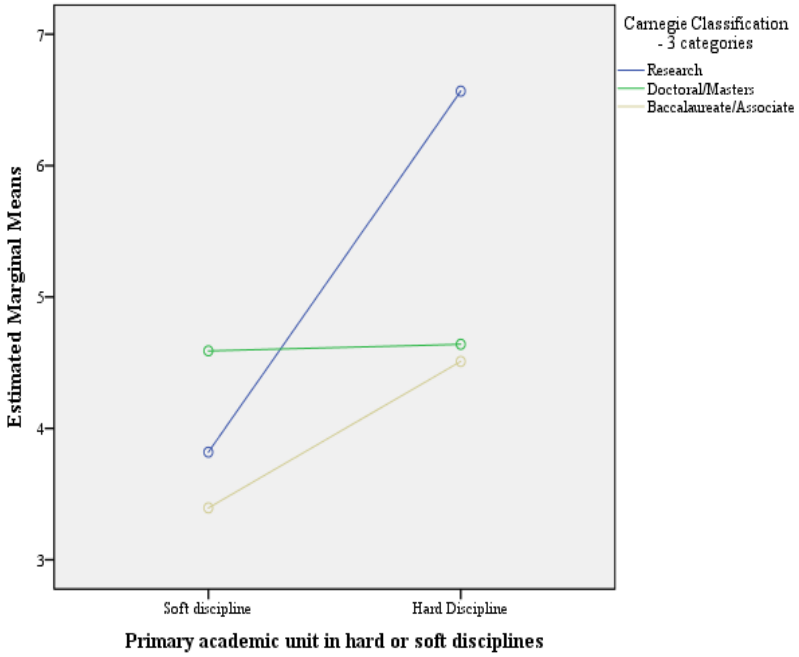

Figure 4.1 Means plot for the interaction of institutional type and discipline on service hours/week when classes are in session

Research question 3. How does gender interact with institutional type (Carnegie Classification or market segment) and disciplinary effects on faculty work? A series of two-way multivariate analyses of variance was performed to investigate how the extent of gender and its interaction with institutional type, market segments, and discipline affect

faculty work patterns. The analysis was broken into three sections corresponding to the triumvirate of faculty work: teaching, research, and service.

Teaching. A two-way multivariate analysis of variance was performed to investigate the effects of gender and the interaction of gender and institutional type (modified Carnegie Classification) with teaching effort and activities: teaching hours/week (in session), teaching hours/week (not in session), total teaching activities, and percent of undergraduate instruction time. There was a significant difference in combined teaching activities between males and females, Pillai's T = 0.04, $F(4, 1234) = 11.93$, $p < 0.001$, partial $\eta^2 = 0.037$, but there was no interaction effect of gender with institutional type ($T = 0.004$, $F(8, 2470) = 0.65$, $p = .739$, partial $\eta^2 = 0.002$). When considering the teaching variables separately, all but percent of undergraduate instruction time were significantly different for males and females. Female faculty (M=24.77, SD = 12.63) taught, on average, more hours per week when classes were in session compared to male faculty (M = 21.83, SD = 11.91). Female faculty (M = 7.48, SD = 6.94) also taught, on average, more hours per week when classes were not in session than male faculty (M = 6.39, SD = 6.68). Total teaching activities indicated by female faculty (M = 7.16, SD = 1.68) were slightly higher than male faculty (M = 6.59, SD = 1.78) (see Appendix Table C.19). There was no significant interaction effect of gender with institutional type when considering the teaching measures separately at the Bonferroni adjusted level of significance of 0.0125.

The results from a two-way multivariate analysis of variance using gender and market segment also indicated that there was no significant interaction effect of gender and market segment on teaching effort and activities, ($T = 0.01$, $F(8, 2422) = 1.63$, p =

0.113). There was also no significant interaction effect of gender with market segments on the individual teaching measures.

A two-way multivariate analysis of variance for the interaction effect of gender and discipline on teaching was conducted. There was a significant interaction effect on the combined teaching variables, Pillai's T = 0.013, $F(4, 1189) = 3.76$, $p = 0.005$, partial $\eta^2 = 0.013$. Considering the teaching variables separately to determine the interaction effect and using the Bonferroni adjusted alpha of 0.0125, three out of the four teaching measures were significantly affected by the interaction of gender with discipline (see Appendix Table C.20).

Figure 4.2 displays the estimated marginal means for teaching hours per week when classes are in session. Females in both disciplinary clusters taught approximately 24.5 hours per week, which is higher than their male colleagues. Male faculty in the soft disciplines reported, on average, 23.7 hours per week for teaching when classes are in session, which is significantly higher than in the hard disciplines, which averaged 19.1 hours per week (see Appendix Table C.21).

Figure 4.3 displays the estimated marginal means for teaching hours per week when classes are not in session. Female faculty in the hard disciplines, on average, reported 8.3 hours per week in teaching activities when classes were not in session. Male faculty in the hard disciplines, on average, reported 5.69 hours per week for teaching. In the soft disciplines, female faculty reported, on average, 7.26 hours per week versus male faculty, who averaged 6.72 hours per work for teaching (see Appendix Table C.21).

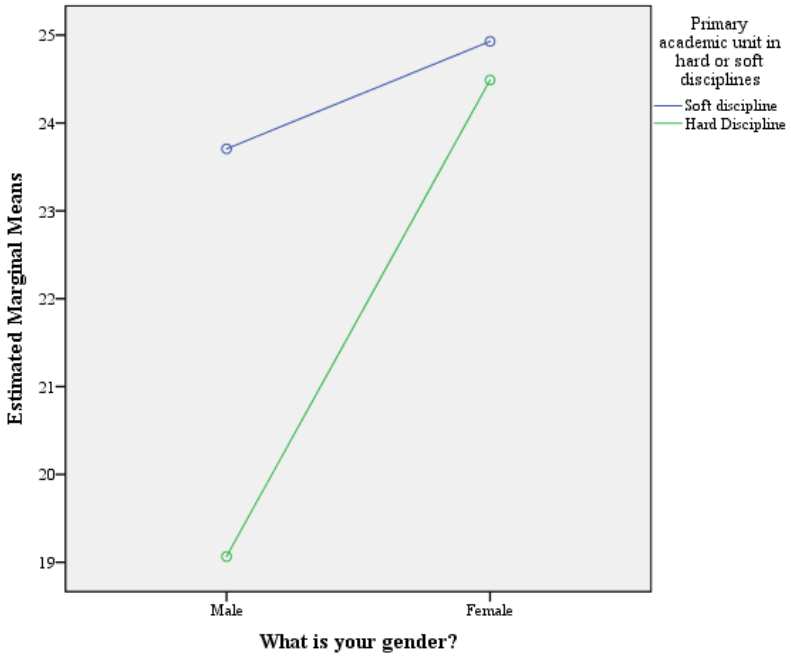

Figure 4.2 Estimated Marginal Means of Teaching hours per week when classes are in session by gender and discipline.

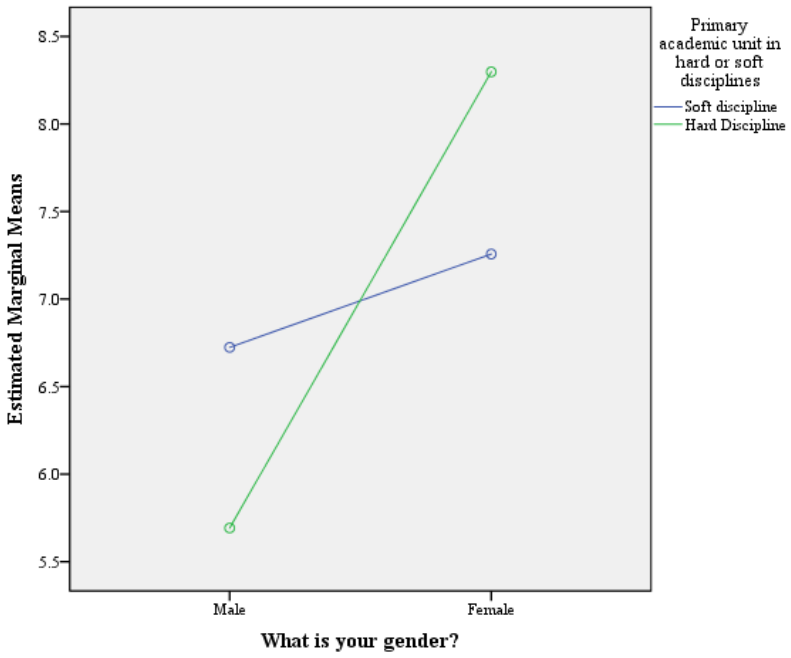

Figure 4.3 Estimated marginal means of teaching hours per week when classes are not in session by gender and discipline.

Figure 4.4 displays the estimated marginal means for total teaching activities by gender and discipline. Female faculty differed significantly between the hard and soft disciplines in average total teaching activities. In the hard disciplines, female faculty averaged 7.58 activities versus the soft disciplines, where their average was 7.0 activities. Male faculty in both disciplinary clusters reported fewer teaching activities than the female faculty, at an average of approximately 6.6 activities (see Appendix Table C.21).

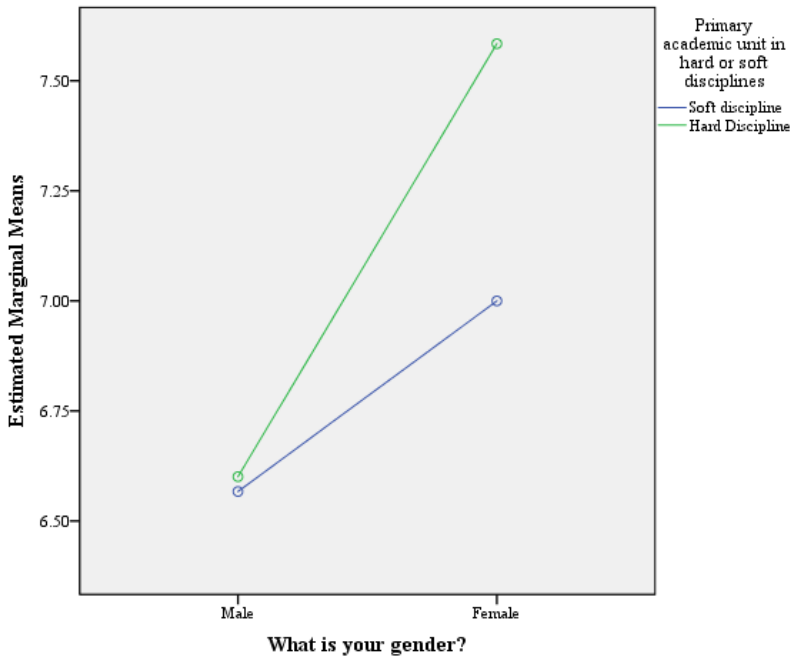

Figure 4.4 Estimated marginal means of total teaching activities by gender and discipline.

Research. A two-way multivariate analysis of variance was conducted to determine if gender and its interaction with institutional type had an effect on the

combination of six research variables: research hours per week when classes are in session, research hours per week when classes are not in session, percent of peer-reviewed publications, percent of the funding for research that came from government entities, research- and grant-related activities, and logarithmic transformed scholarly contributions. Using Pillai's Trace, it was determined that there was a significant effect on the combination of the research variables by gender, $T = 0.05$, $F(6, 533) = 4.64$, $p < 0.001$, partial $\eta^2 = 0.05$, as well as a significant interaction effect of gender and institutional type on the combination of the research variables, Pillai's Trace = 0.06, $F(12, 1068) = 2.69$, $p = 0.001$, partial $\eta^2 = 0.029$.

The effect of gender on the individual research measures was significant for five out of the six research measures. Research hours per week when classes are in session was significantly higher for male faculty ($M = 12.87$, $SD = 10.49$) than for female faculty ($M = 9.34$, $SD = 9.17$). Research hours per week when classes are not in session was also significantly higher for male faculty ($M = 20.74$, $SD = 15.09$) than female faculty (M = 16.88, SD = 14.15). Percent of peer-reviewed publications was, on average, higher for male faculty ($M = 58.35$, $SD = 44.6$) than for female faculty ($M = 46.98$, $SD = 45.52$). Percentage of research funding from government entities was significantly higher for male faculty ($M = 332.83$, $SD = 39.9$) than female faculty ($M = 22.17$, $SD = 34.95$). Male faculty reported, on average, more scholarly contributions ($M = 15.32$, $SD = 28.98$) over the past three years than female faculty ($M = 12.29$, $SD = 26.41$). Total research- and grant-related activities was not significantly different between genders, using a Bonferroni adjusted level of significance of 0.008 (see Appendix C.22.) There were no interaction effects of gender and institutional type on the individual research measures.

The two-way multivariate analysis of variance to determine if there was an interaction effect of gender with market segment on the combined research measures was not significant (Pillai's Trace = 0.03, $F(12, 1034) = 1.39$, $p = 0.165$, partial $\eta^2 = 0.016$). Furthermore, there was no significant interaction of gender with market segment on the individual research measures.

No significant interaction effect of gender and discipline on the combined research measures was present in the two-way multivariate analysis of variance, (Pillai's Trace = 0.01, $F(6, 521) = 1.23$, $p = 0.291$). There was no significance interaction effect on the individual research measures either.

Service. A series of multivariate analyses of variance was conducted to determine if gender and the interaction of gender with institutional type, market segments, and discipline affects faculty participation in service. There was no significant effect of gender on the combination of the five service variables, ($T = 0.003$, $F(5, 1233) = 0.82$, $p = 0.537$) nor on the individual service variables. Similarly, there was no significant interaction effect on the combined service variables for gender with institutional type ($T = 0.01$, $F(10, 2468) = 0.72$, $p = 0.705$), gender with market segments ($T = 0.01$, $F(10, 2420) = 0.63$, $p = 0.786$), or gender with discipline ($T = 0.01$, $F(5, 1188) = 1.33$, $p = 0.251$). When the interaction effects were checked for the five individual services, these were also not significant.

Research question 4. How does appointment type influence faculty work in the context of institutional type (Carnegie or market segment) and discipline? For this set of analysis, appointment type was divided into three categories: tenured, tenure-track, and non-tenure or no tenure. The distribution of faculty across the three appointment types

was 710 tenured, 254 tenure-track, and 263 non-tenure/no tenure. A series of two-way multivariate analyses of variance was performed to investigate the extent to which appointment type and its interaction with institutional type, market segments, and discipline affected faculty work patterns. The analysis was broken into three sections corresponding to the triumvirate of faculty work: teaching, research, and service.

Teaching. A series of two-way multivariate analyses was conducted to determine the effects of appointment type and its interaction with institutional type, market segments, and discipline on the combination of teaching variables: teaching hours/week (in session), teaching hours/week (not in session), total teaching activities, and percent of undergraduate instruction time. There was a significant difference in the combination of teaching measures among the three groups of appointment type, Pillai's Trace = 0.02, $F(8, 2432) = 2.44$, $p = 0.012$, partial $\eta^2 = 0.008$, but there were no significant interaction effects on the combined teaching measure for appointment type with institutional type ($T = 0.01$, $F(16, 4872) = 0.99$, $p = 0.464$), appointment type with market segment ($T = 0.01$, $F(16, 4776) = 0.70$, $p = 0.799$) , and appointment type with discipline ($T = 0.01$, $F(8, 2346) = 1.21$, $p = .289$). Teaching hours/week (not in session) was significantly different among the appointment types, $F(2, 1224) = 5.647$, $p = 0.004$, partial $\eta 2 = 0.009$. The effect of appointment type on the individual teaching measures was not significant at the Bonferroni adjusted level of significance of 0.012.

Research. A series of two-way multivariate analyses of variance was conducted to determine the effect of appointment type on research-related activities and if there were interaction effects of appointment type and institutional type, appointment type and market segment, and appointment type and discipline on the six research variables:

research hours per week when classes are in session, research hours per week when classes are not in session, percent of peer-reviewed publications, percent of the funding for research that came from government entities, research- and grant-related activities, and logarithmic transformed scholarly contributions.

There was a significant effect of appointment type on the combination of the research variables, Pillai's Trace = 0.09, $F(14, 1040) = 3.494$, $p < 0.001$, partial $\eta^2 = 0.045$. Three of the research variables were significantly different by appointment type, when considered individually (see Appendix Table C.23). Research hours per week when classes are not in session was significantly higher by an average 8.38 hours more for faculty in tenure-track appointments ($M = 29.11$, $SE = 1.26$) compared to faculty with non-tenure or no tenure appointments ($M = 20.74$, $SE = 1.57$) and 5.03 hours more compared to tenured faculty ($M = 24.08$, $SE = 0.77$). The percent of peer-review publications was also significantly different between the tenured faculty, who had, on average, 19.02% more peer-reviewed publications than non-tenure/no tenure appointed faculty, but there was no significant difference between tenured and tenure-track faculty or between tenure-track and non-tenure/no tenure appointed faculty (see Appendix Table C.24 and Table C.25).

There was no significant interaction effect on the combination of the research variables for appointment type with institutional type ($T = 0.05$, $F(24, 2120) = 1.20$, $p = 0.226$), appointment type with market segment ($T = 0.05$, $F(24, 2052) = 1.00$, $p = 0.459$), and appointment type with discipline ($T = 0.02$, $F(12, 1034) = 0.64$, $p = 0.811$). Also, when the individual research measures were tested for interaction effects, there were no significant effects.

Service. A series of multivariate analyses of variance was conducted to explore the effects of appointment type and its possible interactions with institutional type, market segment, and discipline on the five service variables: service hours per week when classes are in session, service hours per week when classes are not in session, administration hours per week when classes are in session, administration hours per week when classes are not in session, and service-related activities. There was a significant effect of appointment type on the combination of the service variables, Pillai's Trace = 0.07, $F(10, 2410) = 8.82$, $p < 0.001$, partial $\eta^2 = 0.035$. There was no significant interaction effect of appointment type with institutional type ($T = 0.02$, $F(20, 4828) = 1.2$, $p = 0.244$) and appointment type with market segments ($T = 0.02$, $F(20, 4732) = 1.11$, $p = 0.33$). There was a significant interaction effect on the combined service measure by appointment type and discipline ($T = 0.02$, $F(10, 2324) = 2.06$, $p = 0.025$, partial $\eta^2 = 0.009$).

There were significant differences among appointment type when the service measures were considered individually. Service hours per week when classes are in session was not significantly different among the three appointment types (see Appendix Table C.26). Service (services to client and/or patients, unpaid consulting, public or voluntary services) hours per week when classes are not in session was significantly higher, by 1.94 hours per week, for non-tenure/no tenure faculty ($M = 5.80$, $SE = 0.39$) compared to tenure-track faculty ($M = 4.58$, $SE = 0.23$). There was no significant difference between tenure-track faculty and tenured or between tenured and non-tenure/no tenure faculty (see Appendix Table C.27 and Table C.28).

Administration (committees, department meetings, paperwork) hours per week when class are in session and not in session were significantly different among the appointment types. Tenured faculty (M = 8.03, SE = 0.28) reported an average of 3.23 hours per week more than tenure-track faculty (M = 5.06, SE = 0.46) for administration hours per week when classes are in session. Non-tenure/no tenure faculty (M = 7.01, SE = 0.46) reported, on average, 1.94 hours per week more than tenure-track faculty for administration when classes are in session. However, there was no significant difference between tenured and non-tenure/no tenure faculty for this measure of service. When classes are not in session, tenured faculty (M = 5.81, SE = 0.29) continued to be significantly higher than tenure-track faculty (M = 3.08, SE = 0.49) by 2.73 hours per week and non-tenure/no tenure appointees (M = 5.69, SE = 0.48) were, on average, 2.61 hours per week higher than tenure-track faculty. Similar to when classes are in session, there was no significant difference between tenured and non-tenure/no tenure faculty for administration hours when classes are not in session.

For total service-related activities, there was a significant difference between tenured faculty compared to tenure-track and non-tenure/no tenure faculty. Tenured faculty reported, on average, 2.37 out of the 8 service related-activities, while both tenure-track faculty and non-tenure/no tenure faculty reported an average of 1.90 service-related activities. There was no significant difference between tenure-track faculty and non-tenure/no tenure faculty.

Since appointment type and discipline did have a significant effect on the combination of the five service variables, the interaction effect of appointment type and discipline on the individual service variables was tested, which resulted in only one of the

five being significantly affected by the interaction (see Appendix Table C.29). Service hours per week when classes are in session was significantly affected by the interaction of appointment type and discipline, $F(2, 1165) = 8.21$, $p < 0.001$, partial $\eta^2 = 0.014$. Figure 4.5 displays the estimated marginal means for service hours when classes are in session by appointment type and discipline. There was a significant difference within non-tenure/no tenure appointees in the hard disciplines ($M = 7.35$, $SE = 0.56$) compared to the soft disciplines ($M = 3.47$, $SE = 3.47$). Also, non-tenure/no tenure faculty in the hard discipline reported the highest average service hours per week when classes are in session compared to all of the other faculty. The rest of the faculty were similar in their average service hours per week when classes are in session, and there was no other significant difference found (see Appendix Table C.29).

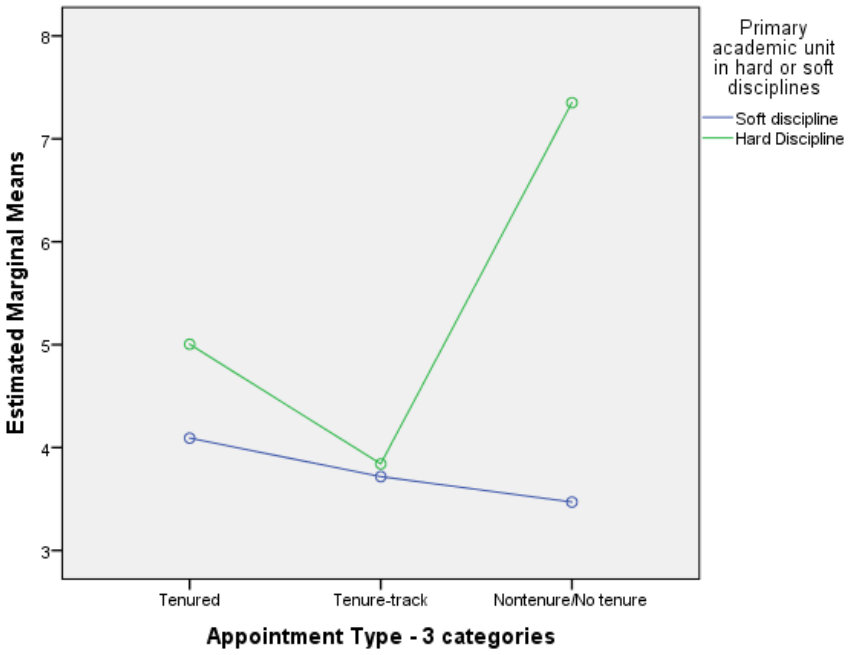

Figure 4.5 Estimated marginal means of service hours per week when classes are in session by appointment type and discipline.

Summary of Results

To explore the effects of institutional type, market segment, discipline, gender, and appointment type on the combinations of the measures of the triumvirate of faculty work, a series of multivariate analyses of variance was performed. The results presented in depth above show that there were significant effects on the all three of the combinations of the measures for teaching, research, and service by institutional type, discipline, and appointment type. Market segments affected the combination of teaching-related variables and the combination of service-related variables. The combination of teaching and of research-related variables were significantly affected by gender. The interactions of discipline with institutional type and appointment type significantly affected the combination of the service measures. The interaction of gender with institutional type significantly affected the combination of research measures. The

interaction of gender with discipline significantly affected the combination of teaching measures (see Tables 4.12–4.14 for the summaries of the MANOVA).

Table 4.12

Summary of multivariate tests - teaching

	Pillai's Trace	F	df (Effect)	df (Error)	Sig.	Partial η^2
Teaching (4)						
Institutional type (3)	0.060	10.01	8	2578	< 0.001**	0.030
Market segments (3)	0.027	4.32	8	2528	< 0.001**	0.013
Discipline (2)	0.022	7.10	4	1238	< 0.001**	0.022
Discipline with Institutional type	0.007	1.12	8	2478	0.349	0.004
Discipline with Market segments	0.005	0.71	8	2432	0.682	0.002
Gender (2)	0.037	11.93	4	1234	< 0.001**	0.037
Gender with Institutional type	0.004	0.65	8	2470	0.739	0.002
Gender with Market segments	0.011	1.63	8	2422	0.113	0.005
Gender with Discipline	0.013	3.76	4	1189	0.005**	0.013
Appointment type (3)	0.016	2.44	8	2432	0.012*	0.008
Appointment type with Institutional type	0.013	0.99	16	4872	0.464	0.003
Appointment type with Market segments	0.009	0.70	16	4776	0.799	0.002
Appointment type with Discipline	0.008	1.21	8	2346	0.289	0.004

* Effect is significant at the 0.05 level (2-tailed).

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

Table 4.13

Summary of multivariate tests - research

	Pillai's Trace	F	df (Effect)	df (Error)	Sig.	Partial η^2
Research (6)						
Institutional type (3)	0.060	2.84	12	1118	0.001**	0.033
Market segments (3)	0.023	1.04	12	1082	0.409	0.011
Discipline (2)	0.336	46.22	6	541	< 0.001**	0.336
Discipline with Institutional type	0.019	0.85	12	1084	0.598	0.009
Discipline with Market segments	0.030	1.32	12	1050	0.2	0.015
Gender (2)	0.050	4.64	6	533	< 0.001**	0.050
Gender with Institutional type	0.059	2.69	12	1068	0.001**	0.029
Gender with Market segments	0.032	1.39	12	1034	0.165	0.016
Gender with Discipline	0.014	1.23	6	521	0.291	0.014
Appointment type (3)	0.079	3.62	12	1056	< 0.001**	0.039
Appointment type with Institutional type	0.054	1.20	24	2120	0.226	0.013
Appointment type with Market segments	0.046	1.00	24	2052	0.459	0.012
Appointment type with Discipline	0.015	0.64	12	1034	0.811	0.007

* Effect is significant at the 0.05 level (2-tailed).

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

Table 4.14

Summary of multivariate tests - service

	Pillai's Trace	F	df (Effect)	df (Error)	Sig.	Partial η^2
Service (5)						
Institutional type (3)	0.019	2.37	10	2478	0.009**	0.009
Market segments (3)	0.016	1.96	10	2430	0.034*	0.008
Discipline (2)	0.024	5.83	5	1188	< 0.001**	0.024
Discipline with Institutional type	0.015	1.76	10	2378	0.062	0.007
Discipline with Market segments	0.010	1.14	10	2334	0.325	0.005
Gender (2)	0.003	0.82	5	1233	0.537	0.003
Gender with Institutional type	0.006	0.72	10	2468	0.705	0.003
Gender with Market segments	0.005	0.63	10	2420	0.786	0.003
Gender with Discipline	0.006	1.33	5	1188	0.251	0.006
Appointment type (3)	0.071	8.82	10	2410	< 0.001**	0.035
Appointment type with Institutional type	0.020	1.20	20	4828	0.244	0.005
Appointment type with Market segments	0.019	1.11	20	4732	0.33	0.005
Appointment type with Discipline	0.018	2.06	10	2324	0.025*	0.009

* Effect is significant at the 0.05 level (2-tailed).

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

Follow-up analysis were conducted to explore the effect of institutional type, market segment, discipline, gender, and appointment type on the individual measures for faculty work. The analysis of variance for institutional type yielded significant results in teaching, research, and service measures. Faculty in research institutions reported, on average, significantly more peer-reviewed publications and more service-related activities than faculty in baccalaureate/associate institutions. Faculty in doctoral/master's institutions reported, on average, a significantly higher percent of undergraduate instruction time than faculty in research institutions. Faculty at baccalaureate/associate's institutions reported, on average, significantly more teaching hours per week when classes are in session compared to faculty at research and doctoral/master's institutions. Faculty at baccalaureate/associate institutions also reported, on average, significantly more teaching hours per week when classes are not in session, a higher percent of undergraduate instruction time, and more teaching activities compared to faculty at research institutions.

Looking at the effect of market segment on the individual measures of faculty work, faculty in the core market segment reported, on average, significantly more administration hours per week when classes are in session than faculty in the convenience market segment. Faculty in the convenience market segment reported, on average, significantly more teaching hours per week when classes are in session and a higher percent of undergraduate instruction time compared to faculty in the core market segment. Faculty in the convenience market segment also reported, on average, significantly more teaching hours per week when classes are not in session compared to faculty in the name-brand market segment.

Follow-up *t*-tests for the mean were conducted to determine if there were significant differences in faculty work between the hard and soft disciplines. Faculty in the hard disciplines reported significantly higher activity levels in the research and service measures, whereas faculty in the soft disciplines reported significantly higher activity levels on the teaching measure. Within the teaching measures, faculty in the soft disciplines reported, on average, significantly more teaching hours per week when classes are in session and a higher percent of undergraduate institution time. Within the research measures, faculty in the hard disciplines reported, on average, more research hours per week when classes are in session, more peer-reviewed publications, more funding for research from government entities, more research- and grant-related activities, and more scholarly contributions. Within the service measures, faculty in the hard disciplines reported significantly more service hours per week when classes are in session, more service hours per week when classes are not in session, and more administration hours per week when classes are not in session.

Follow-up *t*-tests for the mean were conducted to determine if there were significant differences in faculty work between male and female faculty. Male faculty reported significantly higher activity on the majority of research measures whereas female faculty reported significantly higher activity on the majority of teaching measures. Male faculty also reported more research hours per week when classes are in session, more research hours per week when classes are not in session, more peer-reviewed publications, more funding for research from government entities, and more scholarly contributions. Female faculty reported more teaching hours per week when classes are in

session, more teaching hours per week when classes are not in session, and more overall teaching activities.

The follow-up analysis of variance conducted to explore the differences among appointment types yielded significant differences only in research and service measures. Tenured faculty reported significantly more peer-reviewed publications than non-tenure/no tenure faculty. Tenure-track faculty reported significantly more research hours per week when classes are not in session than either tenured or non-tenure/no tenure faculty. Within the service measures, tenured faculty reported significantly more administration hours per week when classes are in session and more administration hours per week when classes are not in session compared to tenure-track faculty. Tenured faculty also reported, on average, significantly more service-related activities compared to tenure-track and non-tenure/no tenure faculty.

The interaction effects of discipline with institutional type, with gender, and. with appointment type were significant for some of the individual measures of faculty work. The interaction effect of discipline with institutional type was significant for service hours per week when classes are in session. Within research institutions, faculty in the hard disciplines reported significantly more service hours per week when classes are in session than faculty in the soft disciplines. Within baccalaureate/associate institutions, faculty in the hard disciplines also reported significantly more service hours per week when classes are in session.

The interaction effect of gender and discipline was significant for three of the teaching measures. Male faculty in the soft disciplines reported significantly more teaching hours per week when classes are in session and more teaching hours per week

when classes are not in session than male faculty in the hard disciplines. Female faculty in the hard disciplines reported significantly more teaching hours per week when classes are not in session and more overall teaching activities than female faculty in the soft disciplines.

The interaction effect of appointment type with discipline was significant for service hours per week when classes are in session. Non-tenure/no tenure faculty in the hard disciplines reported, on average, significantly more service hours per week when classes are in session compared to non-tenure/no tenure faculty in the soft disciplines. There was no significant difference among tenured and tenure-track faculty by discipline for service hours per week when classes are in session.

The above results suggest that faculty work is significantly affected by the influence of institution, market segment, discipline, gender, and appointment type. The next chapter will explore the implications of these results and how they compare to previous research.

Chapter 5

Discussion of Results and Implications

This chapter will discuss the results of this analysis of significant influences on faculty work. Implications for policy and practice will be offered. Finally, the chapter discusses limitations of the study and makes suggestions for future research.

Summary of the Study

This study tested the extent to which academic work might be increasingly organized by institutional market segment rather than traditional categories of institutional types and whether the shaping influences of discipline, type of appointment, and gender persist within these institutional market segment categories. Using the 2007-2008 data from the Changing Academic Profession (CAP) Survey, a series of analyses were conducted to explore the effects of institutional type, market segment, discipline, gender, and type of appointment on the triumvirate of faculty work: teaching, research, and service.

Clark's framework of "small world, different world" has provided a two-dimensional framework to study the effects of institution and discipline on faculty and their work. When adding the theoretical framework of Blackburn and Lawrence's model for predicting faculty role performance, there is a clear rationale for the influence of individual characteristics—gender and appointment type—and environmental characteristics—institution and discipline—on faculty work. Past research on these influences has used the Carnegie Classification system to differentiate institutions, but this does not capture the increasing nature of higher education as a marketplace.

Therefore, Zemsky and Shaman (1997) and others have suggested that differentiation among institutions is more likely to be structured along the lines of market segments. The present study used this combined framework of influences on faculty work and sought to answer the following research questions:

RQ1: To what extent do market segments affect faculty work patterns independent of the Carnegie classifications?

RQ2: How does institutional type (Carnegie or market segment) interact with discipline in affecting faculty work patterns?

RQ3: How does gender interact with institutional type (Carnegie or market segment) and disciplinary effects on faculty work?

RQ4: How does appointment type influence faculty work in the context of institutional type (Carnegie or market segment) and discipline?

The independent variables (influencers) were institutional type, market segments, discipline, gender, and appointment type. The dependent (outcome) variables for faculty work were measured by combinations of self-reported measures of time, activities, and products in the areas of teaching, research, and service (see Figure 5.1). Some of the initial dependent variables were omitted from the final analysis because they were not significantly correlated to the other measures within the area of faculty work. The method used to explore the influences on the combined and separate measures of faculty work was a series of multivariate analysis of variance with follow-up analyses using either an analysis of variance for the three-leveled variables of institutional type, market

segment, and appointment type or a *t*-test for the difference of means for the dichotomous variables of discipline and gender.

Independent Variables

Institutional Type:
- *Research*
- *Doctoral/Masters*
- *Baccalaureate/Associate*

Market Segment:
- *Name-brand*
- *Core*
- *Convenience*

Discipline:
- *Hard*
- *Soft*

Gender:
- *Male*
- *Female*

Appointment Type:
- *Tenured*
- *Tenure-track*
- *Non-tenure/No tenure*

Dependent (Outcome) Variables

Teaching:
- *Teaching hours per week when classes are in session*
- *Teaching hours per week when classes are not in session*
- *Percent of instruction time for undergraduate programs*[*]
- *Approximate average number of student per undergraduate course*
- *Total number of teaching related activities out of a list of ten activities*

Research:
- *Research hours per week when classes are in session*
- *Research hours per week when classes are not in session*
- *Percent of peer-reviewed publications*
- *Percent of research funding from own institution*[*]
- *Percent of research funding from government entities*
- *Total of scholarly contributions*
- *Total number of research and grant related activities from eight activities*

Service:
- *Service hours per week when classes are in session*
- *Service hours per week when classes are not in session*
- *Administrative hours per week when classes are in session*
- *Administrative hours per week when classes are not in session*
- *Total number of service related activities from nine activities*

* Was not included in the analysis because it was not significantly correlated to most of the other variables in that area (Teaching or Research).

Figure 5.1 Independent and Dependent Variables

Discussion of Results

The existing research on the influences on faculty work supports the premise that institutional type, discipline, gender, and appointment type will impact what faculty choose to do. The following discussion of the results will focus on each of the influences on faculty work that were studied in the analysis performed.

Institutional type. Clarks' (1989) research into institutional effects on faculty explored the cultural differences and institutional expectations for faculty work in his description of "small world, different worlds." These differences were evident in this study through the combinations of teaching, research, and service faculty work, as well as through some of the individual measures within the triumvirate. There were three categories used in this study to identify institutional type: research, doctoral/master's, and baccalaureate/associate. The premise, supported by prior research, is that doctoral and master's institutions would have similar institutional policies related to faculty work and would value research more than teaching, but not as much as research institutions, which would require faculty to do more research (Clark, 1987; Blackburn et al., 1991; Blackburn and Lawrence, 1995; Meyer, 1998; Layzell, 1999; Milem et al., 2000). Similarly, baccalaureate and associate institutional expectations related to faculty work would value teaching more than research (Clark, 1987; Blackburn and Lawrence, 1995; Huber, 1997; Meyer, 1998; Layzell, 1999; Milem et al., 2000). The results of the study did find that there were significant effects on the combination of teaching, research, and service effort (time), activities, and products.

Faculty at research institutions reported a higher percent of peer-reviewed publications than faculty at baccalaureate/associate institutions. Interestingly, faculty at

research institutions also reported a slightly larger number of service-related activities than faculty at baccalaureate/associate institutions. The service activity that was indicated the most, regardless of institutional type, was serving as a peer reviewer (58%). When comparing this service activity by institutional type, 71.4% of faculty at research institutions reported serving as a peer reviewer (e.g., for journals, research sponsors, institutional evaluations) versus 45.4% of faculty at baccalaureate/associate institutions. Thus, research-related activities would be more likely with faculty at research institutions than at baccalaureate/associate institutions (Clark, 1987; Blackburn et al., 1991; Blackburn and Lawrence, 1995; Meyer, 1998; Layzell, 1999; Milem et al., 2000).

The shifting balance of teaching versus research for faculty in the three institutional types was significant, with faculty at baccalaureate/associate institutions reporting higher effort and activities related to teaching than faculty at research institutions. Faculty at doctoral/master's institutions only differed from research faculty by reporting a larger percent of undergraduate instruction time. The largest percent of undergraduate instruction time was reported by baccalaureate/associate faculty, at 73%, then declining to 69% for faculty at doctoral/masters' institutions, and further to 56% for faculty at research institutions. Baccalaureate/associate faculty also reported more time spent per week for teaching when classes were in session compared to both research and doctoral/master's faculty.

Market segment. Since the constructs of market segments developed by Zemsky, et al. (1997) are based on undergraduate students, I anticipated that the significant results from my study would be focused on the differences within teaching of faculty work, not within research. There were three market segments used: name-brand, core, and

convenience. The characteristics of institutions in the name-brand market segment are highly selective admissions, primarily full-time students, and higher graduation rates. Given these characteristics, it is possible that the quality of instruction would be highly valued and, therefore, that there would be more institutional value placed on teaching-related activities. The characteristics of institutions in the core market segment are moderate demand and moderately selective admissions, at least 75% full-time students, and at least 50% graduation rates. The third market segment, the convenience segment, includes institutions that are not as selective, heavily part-time students (at least 25% part-time students), and lower graduation rates (less than 50% graduation).

The major differences between faculty within the convenience market segment and the core market segment were more reported hours for teaching when classes were in session and the percent of undergraduate instruction time for faculty within the convenience market segment. Faculty in the convenience market segment reported, on average, 2.36 more hours per week teaching when classes are in session compared to faculty in the core market segment. The percent of undergraduate instruction time for faculty within the convenience market segment was approximately 72%, versus 63% for faculty within the core market. There was also a significant difference in hours spent on teaching when classes were not in session for faculty between faculty in the convenience market segment compared to faculty within the name-brand market segment. Surprisingly, there was no significant difference between these two market segments when classes were in session, which would indicate that faculty at both name-brand and convenience institutions spent a similar amount of time on teaching related activities.

The other area of faculty work that was significantly different among the market segments was service. Faculty in the core market segment institutions reported more hours per week for administration when classes are in session than faculty in the convenience segment. Administration activities included committees, department meetings, and paperwork. This difference may be explained by the fact that the convenience market segment was comprised of community colleges and other colleges that would be more focused on teaching than service activities and, therefore, less likely to be engaged in service activities, or by the fact that the core segment institutions serve a larger body of students and there is a greater need for administrative services when classes are in session.

Discipline and interaction with institution. For this study, discipline was categorized using Biglan's (1973) categories of hard versus soft disciplines to distinguish the disciplinary influences on faculty work. The hard disciplines include the pure sciences and technologies while the soft disciplines include applied social science and the humanities. Prior research reported that faculty in the hard disciplines devote more time to research and produce more publications while faculty in the soft disciplines allocate more time to teaching (Clark, 1987; Blackburn et al., 1991; Blackburn and Lawrence, 1995). The results of this study confirmed that most of the measures for research were significantly higher for faculty in the hard disciplines. The faculty in the hard disciplines reported almost two hours per week more for research when classes are in session, while there was no significant difference in research hours between faculty in the hard and soft disciplines when classes were not in session, and both groups reported at least 19 hours per week. When looking at the differences of research in terms of publications and

scholarly contributions, faculty in hard disciplines reported 15% more peer-reviewed publications and an average of five more scholarly contributions compared to faculty in the soft disciplines. This significant difference may support the premise that the hard disciplines value peer-reviewed publications and its faculty are encouraged to produce more scholarly contributions compared to faculty in the soft disciplines.

In contrast, faculty in the soft disciplines were significantly higher for teaching related work. Specifically, faculty in the soft disciplines reported on average 3 more hours per week for teaching and reported 7% more for undergraduate instruction time. Again supporting the premise that soft disciplines support and value teaching related work or that universities require faculty in the soft disciplines to teach more.

Faculty service work was also significantly higher for the hard discipline versus the soft disciplines. This difference may be further explained by the interaction of discipline and institutional type. The study found that faculty at research and baccalaureate/associate institutions in the hard disciplines spent significantly more time on service when classes were in session compared to their colleagues in the soft disciplines. Since service hours includes services to clients and/or patients, unpaid consulting, and public or voluntary services, it is possible that this is an indication of academic entrepreneurship in the sciences and technology.

Gender and interactions with institution and discipline. Prior research on gender's effect on faculty work determined that men were more likely to spend more time on research and publish more while women would spend more time on teaching and service (Astin, 1978; Twale and Shannon, 1996; Bellas and Toutkoushian, 1999; Sax et al., 2002; Link et al., 2008; Cummings and Finkelstein, 2010; Winslow, 2010; Misra et

al., 2011; Kessler et al., 2014). This study confirmed that the combined measures of research were significantly influenced by gender and the interaction of gender and institution. Most of the measures for research work (time allocation, percentage of peer-reviewed publications, grant related measure, and scholarly contributions) were significantly higher for men than for their female colleagues. Male faculty reported about 4 hours per week on research, 11% more peer-reviewed publications, and an average of three more scholarly contributions than female faculty.

The combined measure of teaching work was significantly higher for female faculty compared to male faculty. Female faculty reported three hours per week more on teaching when classes were in session and an hour per week more on teaching when classes were not in session. This result is similar to what Winslow (2010) reported in her study looking at time allocations using NSOPF-1999 data. She reported that women preferred to spend more time teaching and less time on research.

The interaction effect of gender with discipline was significant for the combined teaching measures and for teaching hours. When comparing men and women in the soft disciplines, there was no difference in the time allocated for teaching. Men in the hard disciplines reported four hours per week less that faculty in the soft disciplines, regardless of gender, for teaching when classes were in session. This could imply that men in the hard disciplines tend to devote more time to research than teaching, which is similar to the results of the study by Misra et al. (2011), who studied STEM versus non-STEM faculty. In the comparison of women and their time allocation for teaching when classes are not in session, women in the hard disciplines reported more hours those than in the soft disciplines, but there was not a significant difference.

Appointment type and interactions with discipline. Much of the prior research on faculty work and the effect of appointment type has reported that there are differences in the work done comparing tenure/tenure-track faculty and non-tenure track faculty. These studies usually have focused on either profiling the work done by faculty by appointment type in the context of their institution (Gappa et. al., 2007; Finkelstein and Schuster, 2001, 2006; Bland et al., 2005; O'Meara, Terosky, & Neumann, 2008) and/or department (Baldwin and Wawrzynski, 2011; Geiger, 2011; Kezar, 2012; Kezar, 2013). Schuster (2011) addressed the re-stratification of the academic profession to include appointment type as defining the roles of faculty, along with institution and discipline. Faculty role expectations would be that non-tenure track faculty are devoted to teaching whereas tenure/tenure-track faculty are more active in research and less in teaching.

Appointment type was found to be a significant influence on the combined measures of teaching, research, and service in the present study. While there were no significant differences in the specific measures for teaching, there were differences in some of the research and service measures among the appointment types. In the context of research, tenured faculty reported a higher percent of peer-reviewed publications than non-tenure track faculty and tenured-track faculty reported more research hours per week when classes were not in session compared to both tenured and non-tenure track faculty. These results were consistent with the premise that non-tenure track faculty are not expected to engage in research as much as their tenure/tenure-track colleagues, as found in previous research (Bland et al., 2010; Kezer, 2012; Kezar, 2013). Also, the differences in time allocation between tenured and tenure-track faculty for research when classes are

not in session is consistent with the expectations that tenure-track faculty are expected to conduct more research in their pursuit of achieving tenure.

In the context of service, tenured and non-tenure track faculty reported significant differences compared to tenure-track faculty. Tenured faculty reported three hours per week more than tenure-track faculty for administration service, which includes committees, department meetings, and paperwork. Non-tenure track faculty reported almost two hours per week more than tenure-track faculty for service when classes are not in session, which include services to clients and/or patients, unpaid consulting, and public or voluntary services. This difference in time allocation for service hours when classes are not in session between non-tenure track faculty versus tenured faculty may be due to the fact that non-tenure track faculty are engaged in consulting and other professional services outside of their responsibilities of teaching classes.

There was a significant interaction effect between appointment type and discipline on the combined measure of service. Service hours per week when classes are in session were similar for tenured and tenure-track faculty, regardless of discipline. Non-tenure track faculty in the hard disciplines reported four more hours per week for service compared to non-tenure track faculty in the soft disciplines. Recall that the hard disciplines include sciences and technology, which would also include health and medical sciences; therefore, it is likely that the difference is due to work outside of teaching classes.

Conclusion

The purpose of this study was to explore the extent that environmental (institution, market segment, departmental discipline) and individual (gender and appointment type) characteristics influence faculty role performance measured by time spent, activities, and total scholarly contributions that faculty reported for teaching, research, and service in the CAP 2007 Survey. The analysis resulted in supporting prior research on the effects of institution, discipline, gender, and appointment type on faculty work and added the influence of market segments as another institutional classification.

Faculty work was distinguished by institutional type, where research and service work was reportedly higher at research institutions and teaching work was higher at doctoral/master's and baccalaureate/associate institutions. Faculty in the hard disciplines (sciences and technology) were more focused on research and service while faculty in the soft disciplines were more focused on teaching. The combination of institutional and disciplinary influences followed Clark's premise of "small worlds, different worlds."

This study added the use of market segments as a classification of institution type to determine if doing so would provide another dimension to the environmental conditions that may influence what faculty do. Market segments classify the institutions based on undergraduate admissions, demand, five-year graduation rates, percentage of baccalaureate degrees, and percentage of part-time students rather than on the constructs used by the Carnegie Classification, which is heavily influenced by research activities and funding. The analysis on the influence on faculty work by market segments differentiated between combined teaching and service work, especially in the comparison of convenience market segments to core and name-brand market segments. The lack of a

significant result for the effect of market segments in research can be explained by the infusion of research across institutional types that has occurred since Boyer's (1990) work on defining scholarship to include more avenues for faculty to report scholarly contributions and research activities.

The effects of gender on faculty work continue to be significant. There is still evidence of gender differences in what faculty do. Male faculty still tend to do more research while female faculty are more focused on teaching. Even in the context of institutional type and discipline, work is differentiated by gender. Market segments did not have an interaction effect with gender, even though the distribution of male and female faculty within each market segment was similar to the overall distribution for the survey (55% male and 44% female), with the exception of the name-brand segment, which had 63% males and 37% females.

With the growing use of non-tenure track faculty by institutions to focus primarily on teaching undergraduates, the question was whether the survey would show non-tenure track faculty engaged in more teaching work versus research. Appointment type was significant in effecting all three areas of faculty work, but only a few research and service measures were significantly different among the appointment types. The interaction between appointment type and discipline was significant only for service. The lack of significant interaction effects between appointment type and institutional type or market segment seems to contradict the premise that there is a bifurcation of faculty based on appointment type (Geiger, 2011).

Implications for Policy

After looking through the results of the study, there are two recommendations for policy that I would like to focus on. The first is looking at how institutions and departments can use the results of this study and the second is filling the need for a national survey of faculty professions.

Recommendation 1. This study provides clear evidence that there are significant environmental influences on faculty role performance. Also, with the increased use of non-tenure track faculty, it would be important that there are clear guidelines of institutional and departmental policy or expectations for what faculty role performance should entail, as well as guidance on determining how well faculty are performing within these guidelines in alignment with the nature of the appointment type. For example, a faculty guide or standards for merit would have clear measures for the percentage of time expected for teaching, research, and/or service to be consistent with the nature of the appointment. From this study, an example of the guidelines for tenured faculty may be that there would be an expectation of a higher percentage of time committed to service and administrative duties in comparison with tenure-track or non-tenure track appointments. Another example would be that if the non-tenure appointee was hired for the primary purpose of teaching, then merit could be awarded to that faculty based on outstanding work in teaching and/or scholarship in teaching and learning. Having guidelines that follow what faculty are actually doing would help to provide a supportive environment for faculty to work.

Recommendation 2. If the landscape of academic work is changing or evolving because of the influences of marketization or commercialization, then research on faculty

work is dependent on the data that is available. The data that was used for the study was collected almost ten years ago, and the profile of the faculty at institutions may have changed over ten years. While there are other databases available for research on faculty, they tend to either be limited by participants, such as HERI, or to report smaller studies. There is a need for a national database such as NSOPF that is more current and that draws from a larger sample to include all types of faculty and institutions.

Implications for Practice

This study introduced the use of market segments as another lens through which the institutional effect on faculty role performance could be viewed. Previous research on higher education has focused on using the Carnegie Classification to categorize institutions, which utilizes research activities and funding as one of the major criteria. As a result, many institutions, in their pursuit for higher prestige, have created a research mindset and, thus, have created an environment that values and encourages faculty to do more research. However, because of the nature of the Carnegie Classification, faculty in research institutions report doing more research and faculty in baccalaureate/associate institutions report less research. Introducing the market segment as a way to classify institutions may have shown that faculty are doing research and scholarly activities regardless of the market niche of the institution, providing a possible leveling tool for observing faculty work that captures the trends of more research across higher education.

The results of this study showed that market segments are also useful for distinguishing differences in teaching and service. The greatest differences were observed between the core and convenience market segments. The convenience market segment was significantly higher for teaching hours and percentage of undergraduate

instruction time, whereas the core market segment was significantly higher in hours spent on committees, department meetings, and paperwork.

Market segments classified institutions based on undergraduate admissions/demand, graduation rates, degree attainment, and percent of full-time enrollment. This was proposed as an alternate classification for institutions in light of the commercialization of higher education. Since there was research on doctoral and master's institutions within the convenience market segment, this leads to question of whether a model based solely on undergraduate students will represent the institutions accurately. There is the possibility that universities with graduate programs may be a part of the core market segment for undergraduates, and then the convenience market segment for graduate programs, or even further internal differentiation of the institutions, where specific colleges, schools, or programs within the institution operate as different market segments.

Limitations

There were three limitations to this study that may have affected its results: distribution of institutions across the market segments, distribution of respondents across the categories used for the study, and the use of self-reported data.

There were 149 institutions that were represented in the data from the CAP 2007-2008 survey, which spanned across the five basic Carnegie Classifications. Of those institutions, only 83 which were baccalaureate, and none of these institutions were classified within the name-brand segment. In Zemsky et al.'s (1997) report on the development of the market segments, the majority of the name-brand institutions were

private institutions and, therefore, would have had baccalaureate institutions within the segment. So, this study may not have had a representative sample of the institutions for the name-brand segment. The size and breathe of the data used may not have given a large enough distribution across institutional types, market segments, disciplines, and appointment types. This would affect the results of the multivariate analysis of variance. While the sample size was sufficient to show significant results, the overall effect size of many of the results were small, which would indicate that the significant results may not be as different as hoped.

As already noted in Chapter 3, there is a possibility of bias with self-reported data. It is not clear if the reported hours in each of the areas of faculty work were accurate, as it required the respondents to recall a general trend of hours spent on particular tasks per week. Clearly, there will be weeks where the respondent may engage in one type of activity more than another and, as a result, the hours reported in the survey may not have given an accurate average of time spent per week. Also, for scholarly contributions, there is no measure for quality of the contribution, just quantity. So, for the faculty member that reported an extremely large amount of scholarly contributions, it was unclear whether these were large or small products, or the merit of the product. Therefore, there needs to be a better way to measure the products of scholarly contributions that would be more equitable across disciplines.

Recommendations for Further Research

While this study has provided results that concur with prior research, there are still some questions that could be explored further. There are two possible areas for future research: market segments and models for exploring influences on faculty work.

Market segments. Using market segments as a taxonomy for institutions, in the past, has focused on student outcomes and the marketization of higher education. This study used market segments to look at institutional effects on faculty role performance. The following questions could also be asked:

- Why are there research, doctoral, and master's institutions in the convenience market segment? For this study, close to 30% of the institutions in the convenience market segment were research, doctoral, and master's institutions. What are the characteristics of these institutions?

- Can market segments help explore institutional differentiation? Is it possible to create a similar taxonomy for graduate education and be able to distinguish if an institution may be in the convenience market segment for undergraduate programs and another market segment for graduate programs?

- How do online undergraduate programs affect the market segment of an institution? Online programs lend themselves to convenience and to user-friendly programs. Therefore, would an institution like Southern New Hampshire University be classified as convenience or core?

Other models. Some of the factors and interactions were significant for the combined measures, but the post hoc tests did not indicate significant differences among

the groups, so further study on the distinctions between teaching and research faculty would be helpful. Either a follow-up discriminant analysis or a cluster analysis would address this issue.

Another possible extension of the study would be to compare the results to a prediction model similar to Blackburn and Lawrence's (1995) to investigate further the effects that institution, market segment, discipline, gender, and appointment type have on selected measures of faculty work. The advantage of a predictive model is that all of the factors are considered together, which may illuminate if one can predict the behavior of faculty towards their work in teaching, research, and service.

Lastly, another direction that would be worthwhile investigating is using Holland's academic environment for disciplinary influence. Biglan's model worked well with the smaller sample available from the CAP 2007 Survey, but the prior research reviewed for the study indicated that Holland's academic environment may work well to explain the influence of discipline on faculty work. Also, the inclusion of Holland's categories may help to explain some of the results dealing with appointment type and its effect on service.

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Appendix A

Market Segment Worksheet

Copied from *Change* November/December 1997 pp. 37 - 38

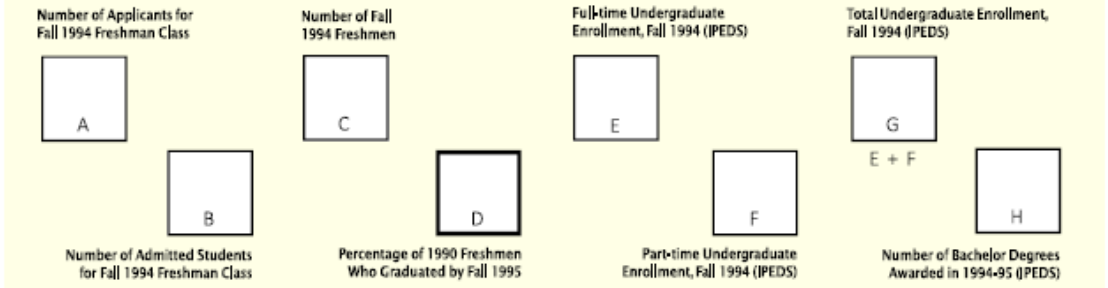
Market Segment Worksheet

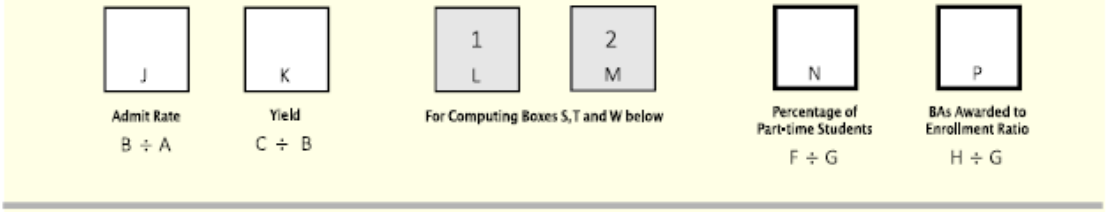
You can use this worksheet—which replicates the method used to derive the market taxonomy—to determine an institution's market segment, and then compare its financial and student data with the benchmarks of segment peers described in the article.

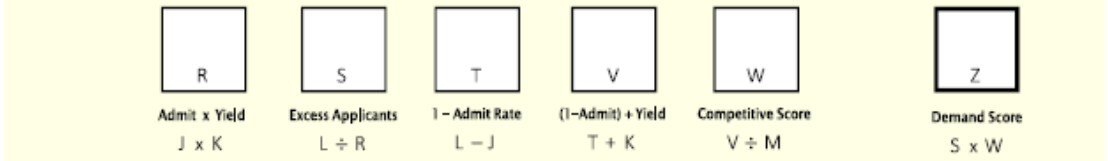
Placement in a particular market segment of the taxonomy is based on two sets of values, or "scores": one measuring an institution's position on the left edge, or *name brand* sector, of the market; and the other measuring position on the right edge, or *convenience/user-friendly* sector. The left-edge position is based on a calculated demand score (using admit and yield rates) from Box Z, and the percentage of freshmen matriculating in 1990 who graduated by the fall of 1995 from Box D. The right-edge position is determined by the percentage of students enrolled part-time from Box N, and the ratio of the number of bachelor's degrees awarded to total enrollment from Box P.

Follow the instructions at the top or bottom of each box to determine these values. To reproduce the analysis presented in this issue of *The Landscape*, use data from the 1994–95 academic year. You may also recalculate these values using more recent data to see if an institution has changed its market position.

After making all of the entries and computations, find the market segment by following the instructions on the next page. Compare both sets of calculated values with the entries in the tables provided. The tables contain the criteria used to sort institutions into their respective market segments.







Worksheet continued on next page.

Market Segment Worksheet (continued)

Use the tables below to identify an institution's market segment. The column and row labels of both tables contain the criteria for determining the left-edge and right-edge market segments (or scores). Read the column labels from left to right, and the row labels from top to bottom. You will derive the institution's market segment from the entries in the table cells.

STEP 1: Determine your left-edge score.

Compare **Boxes Z** and **D** of the worksheet (on the previous page) with the column and row labels in the table below. Select the first column for which the value in **Box Z** meets the criteria; then find the first row for which the value in **Box D** meets the criteria. The cell at the intersection of the selected column and row contains the left-edge score.

		Demand Score (Box Z) →			
5-Year Graduation Rate (Box D) ↓		Greater than or Equal to 4.0	Greater than or Equal to 1.5	Greater than or Equal to 1.0	Less than 1.0
Greater than or Equal to	90%	1	2	3	4
Greater than or Equal to	85%	2	2	3	4
Greater than or Equal to	64%	3	3	3	4
Greater than or Equal to	50%	4	4	4	4
Less than	50%	5 or higher	5 or higher	5 or higher	5 or higher

Record your left-edge score in this box: ☐

STEP 2: Determine your right-edge score.

Compare **Boxes N** and **P** of the worksheet (on the previous page) with the column and row labels in the table below. Select the first column for which the value in **Box N** meets the criteria; then find the first row for which the value in **Box P** meets the criteria. The cell at the intersection of the selected column and row contains the right-edge score.

		Percentage of Part-time Students (Box N) →		
Bachelor's Degrees to Undergraduate Enrollment (Box P) ↓		More than 35%	More than 25%	Less than or Equal to 25%
Less than or Equal to	10%	7	6	5 or lower
Less than or Equal to	15%	6	6	5 or lower
Greater than	15%	5 or lower	5 or lower	5 or lower

Record your right-edge score in this box: ☐

STEP 3: Determine your market segment.

- If your left-edge score is "5 or higher," then your segment is determined by the right-edge score.
- If your right-edge score is "5 or lower," then your segment is determined by your left-edge score.
- If your right-edge score is "5 or lower," and your left-edge score is "5 or higher," your segment is 5.
- If your right-edge score is 6 or 7, and your left-edge score is 4 or less, then you should decide which segment (either 6 or 7) is most appropriate. In the analysis presented here, schools with a right-edge score of 6 or 7 and a left-edge score of 4 were placed in either Segment 6 or 7.

Record your final market segment in this box: ☐

Appendix B

Changing Academic Profession Survey

The Changing Academic Profession, 2007-8:
The U.S. Component of an International Survey
[Paper Version, February 2008]
Directions: Please place an 'X' in the appropriate box(es).

I. General Work Situation and Activities

B1A. Are you teaching now or did you teach during the previous (2006-07) academic year?

1 ☐ **Yes**
2 ☐ **No**

B1 ***Considering all your professional work, how many hours do you spend in a typical week on each of the following activities when classes are and are not in session? (If you are not teaching during the current academic year, please reply to the second column only.)***

Hours per week when classes are in session	Hours per week when classes are not in session	
☐☐	☐☐	Teaching (preparation of instructional materials and lesson plans, classroom instruction, advising students, reading and evaluating student work)
☐☐	☐☐	Research (reading literature, writing, conducting research, fieldwork)
☐☐	☐☐	Service (services to clients and/or patients, unpaid consulting, public or voluntary services)
☐☐	☐☐	Administration (committees, department meetings, paperwork)
☐☐	☐☐	Self-employment
☐☐	☐☐	Other academic activities (professional activities not clearly attributable to any of the categories above)

B2 ***Regarding your own preferences, do your interests lie primarily in teaching or in research?***

1 ☐ Primarily in teaching
2 ☐ In both, but leaning towards teaching
3 ☐ In both, but leaning towards research
4 ☐ Primarily in research

B3 ***At this institution, how would your evaluate each of the following facilities, resources, or personnel you need to support your work?***

Excellent 1	2	3	4	Poor 5	Not Applicable	
☐	☐	☐	☐	☐	☐	Classrooms
☐	☐	☐	☐	☐	☐	Technology for teaching
☐	☐	☐	☐	☐	☐	Laboratories
☐	☐	☐	☐	☐	☐	Research equipment and instruments
☐	☐	☐	☐	☐	☐	Computer facilities
☐	☐	☐	☐	☐	☐	Library facilities and services
☐	☐	☐	☐	☐	☐	Your office space
☐	☐	☐	☐	☐	☐	Secretarial support
☐	☐	☐	☐	☐	☐	Telecommunications (Internet, networks, and telephones)
☐	☐	☐	☐	☐	☐	Teaching support staff
☐	☐	☐	☐	☐	☐	Research support staff
☐	☐	☐	☐	☐	☐	Research funding

B4 ***Please indicate the degree to which each of the following affiliations is important to you.***

Very important 1	2	3	4	Not at all important 5	
☐	☐	☐	☐	☐	My academic discipline/field
☐	☐	☐	☐	☐	My department (at this institution)
☐	☐	☐	☐	☐	This institution

B5 ***Please indicate your views on the following***

Strongly Agree 1	2	3	4	Strongly Disagree 5	
☐	☐	☐	☐	☐	Scholarship is best defined as the preparation and presentation of findings on original research
☐	☐	☐	☐	☐	Scholarship includes the application of academic knowledge in real-life settings
☐	☐	☐	☐	☐	Scholarship includes the preparation of reports that synthesize the major trends and findings of my field
☐	☐	☐	☐	☐	This is a poor time for any young person to begin an academic career in my field
☐	☐	☐	☐	☐	If I had it to do over again, I would not become an academic
☐	☐	☐	☐	☐	My job is a source of considerable personal strain
☐	☐	☐	☐	☐	Teaching and research are not compatible with each other
☐	☐	☐	☐	☐	Faculty in my discipline have a professional obligation to apply their knowledge to problems in society

B6 ***How would you rate your overall satisfaction with your current job at this institution?***

Very high — Very low

1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐

B7 ***Since you started your career, have the overall working conditions in higher education improved or declined?***

Very much improved — Very much deteriorated

1	2	3	4	5	
☐	☐	☐	☐	☐	Working conditions at this institution
☐	☐	☐	☐	☐	Working conditions in higher education and academic research generally

II. Teaching

Refer to the current academic year or the previous academic year – if you are not teaching this year.
If you did not teach during the current or previous academic year, please skip to C3.

C1 ***Please indicate the proportion of your teaching responsibilities during the current (or previous) academic year that are devoted to instruction at each level below and the approximate number of students you instruct at each of these levels***

Percent of instruction time	Approximate average number of students per course	
☐☐	☐☐☐	Undergraduate programs
☐☐	☐☐☐	Master programs
☐☐	☐☐☐	Doctoral programs
☐☐	☐☐☐	Continuing professional education programs
☐☐	☐☐☐	Other

C2 ***During the current (or previous) academic year, have you been involved in any of the following teaching activities?*** **(Mark all that apply)**

1 ☐ Classroom instruction/lecturing

2 ☐ Individualized instruction

3 ☐ Learning in projects/project groups

4 ☐ Practice instruction/ laboratory work

5 ☐ ICT-based learning/computer-assisted learning

6 ☐ Distance education

7 ☐ Development of course material

8 ☐ Curriculum/program development

9 ☐ Face-to-face interaction with students outside of class

10 ☐ Electronic communications (e-mail) with students

☐ None of the above

C3 ***Does your institution set quantitative load targets or expectations for individual faculty for the following:*** **(Mark all that apply)**

1 ☐ Number of hours in the classroom

2 ☐ Number of students in your classes

3 ☐ Number of graduate students for supervision

4 ☐ Percentage of students passing exams

5 ☐ Time for student consultation

6 ☐ None of the above

C4 ***Please indicate your views on the following:***

Strongly agree				Strongly disagree	
1	2	3	4	5	
☐	☐	☐	☐	☐	You spend more time than you would like teaching basic skills due to student deficiencies
☐	☐	☐	☐	☐	You are encouraged to improve your instructional skills in response to teaching evaluations
☐	☐	☐	☐	☐	At your institution there are adequate training courses for enhancing teaching quality
☐	☐	☐	☐	☐	Practically oriented knowledge and skills are emphasized in your teaching
☐	☐	☐	☐	☐	In your courses you emphasize international perspectives or content
☐	☐	☐	☐	☐	You incorporate discussions of values and ethics into your course content
☐	☐	☐	☐	☐	You inform students of the implications of cheating or plagiarism in your courses
☐	☐	☐	☐	☐	Grades in your courses strictly reflect levels of student achievement
☐	☐	☐	☐	☐	Since you started teaching, the number of international students has increased
☐	☐	☐	☐	☐	Currently, most of your ~~graduate~~ students are international
☐	☐	☐	☐	☐	Your research activities reinforce your teaching
☐	☐	☐	☐	☐	Your service activities reinforce your teaching

C5 ***During the current (or previous) academic year, are you teaching any courses. ...*** **(Mark all that apply)**

1 ☐ Abroad

2 ☐ in a language different from the language of instruction at your current institution

2 ☐ Neither

III. Research

D1aa. Are/Were you active in research in this or the previous academic year?

1 ☐ **Yes**
2 ☐ **No**

If "No" , please skip to D4.

D1 ***How would you characterize your research efforts during this (or the previous) academic year?***

Yes	No	
1 ☐	1 ☐	Are you working individually (without collaborators) on any of your research projects?
2 ☐	2 ☐	Do you have collaborators in any of your research projects?
		If you have collaborators in any of your research projects,
3 ☐	3 ☐	Do you collaborate with persons in the US?
4 ☐	4 ☐	Do you collaborate with international colleagues?

D1a. If you have collaborated with *international* colleagues, from which principal country or region do they originate? *(Mark all that apply)*

☐ Mexico ☐ European Union ☐ Canada ☐ South or Central America ☐ United Kingdom ☐ Asia

☐ Africa ☐

D2 ***How would you characterize the emphasis of your primary research this (or the previous) academic year?***

Very much				Not at all	
1	2	3	4	5	
☐	☐	☐	☐	☐	Basic/theoretical
☐	☐	☐	☐	☐	Applied/practically-oriented
☐	☐	☐	☐	☐	Commercially-oriented/intended for technology transfer
☐	☐	☐	☐	☐	Socially-oriented/intended for the betterment of society
☐	☐	☐	☐	☐	International in scope or orientation
☐	☐	☐	☐	☐	Based in one discipline
☐	☐	☐	☐	☐	Multi-disciplinary

D3 ***Have you been involved in any of the following research activities during this (or the previous) academic year?*** **(Mark all that apply)**

1 ☐ Preparing and conducting experiments, inquiries etc.

3 ☐ Supervising a research team or graduate research assistants

4 ☐ Writing academic papers that contain research results or findings

5 ☐ Technology transfer

6 ☐ Answering calls for proposals or writing research grants

7 ☐ Managing research contracts and budgets

8 ☐ Purchasing or selecting equipment and research supplies

8 ☐ None of the above

D7 ***In the current (or previous) academic year, what percentage of the funding for your research came from.*** **[Round to whole percents.]**

☐☐☐ Your own institution

☐☐☐ Government entities

☐☐☐ Business firms or industry

☐☐☐ Private not-for-profit foundations/agencies

☐☐☐ Your own household or personal income

☐☐☐ Other (please specify).....

D8 ***If you had any funding for your research from sources external to you and your institution, what percentage of any such external funding for your research came from …***

☐☐☐ U.S. organizations/entities

☐☐☐ International organizations/entities

D4 ***How many of the following scholarly contributions have you authored, edited or presented in the past <u>three</u> years?*** **[If none, please mark box at bottom ONLY. Do not enter "0" for each row].**

☐☐ Scholarly books you authored or co-authored

☐☐ Scholarly books you edited or co-edited

☐☐ Articles or chapters published in an academic book or journal

☐☐ Research report/monograph written for a funded project

☐☐ Paper presented at a scholarly conference

☐☐ Professional article written for a newspaper or magazine

☐☐ Patent secured on a process or invention

☐☐ Computer program written for public use

☐☐ Artistic work performed or exhibited

☐☐ Video or film produced

☐☐ Others (please specify):.....

1☐ Have not contributed to any of the above in the past three years **[SKIP TO D6]**

D5 ***If you had publications in the last <u>three</u> years, what percentage (*****in whole percents*****) were***

☐☐☐ published in a language different from the language of instruction at your current institution

☐☐☐ co-authored with colleagues located in the U.S.

☐☐☐ co-authored with colleagues located in other (foreign)countries

☐☐☐ published in a foreign country

☐☐☐ On-line or electronically published

☐☐☐ Peer-reviewed

D6 ***Please indicate your views on the following***

Strongly agree 1	2	3	4	Strongly disagree 5	NA	
☐	☐	☐	☐	☐	☐	Restrictions on the publication of results from my publicly-funded research have increased since my first appointment
☐	☐	☐	☐	☐	☐	Restrictions on the publication of results from my privately-funded research have increased since my first appointment
☐	☐	☐	☐	☐	☐	External sponsors or clients have no influence over my research activities
☐	☐	☐	☐	☐	☐	The pressure to raise external research funds has increased since my first appointment
☐	☐	☐	☐	☐	☐	Inter or multi disciplinary research is emphasized at my institution
☐	☐	☐	☐	☐	☐	Your institution emphasizes commercially-oriented or applied research
☐	☐	☐	☐	☐	☐	Your research is conducted in full-compliance with ethical guidelines
☐	☐	☐	☐	☐	☐	Research funding should be concentrated on the most productive researchers
☐	☐	☐	☐	☐	☐	High expectations to increase research productivity are a threat to the quality of research
☐	☐	☐	☐	☐	☐	High expectations of useful results and application are a threat to the quality of research

IV. Management

E1 ***At your institution, which actor has the primary influence on each of the following decisions?*** **(please check only one column on each decision*)***

Government or external stakeholders	Central Administration	Deans or Department Chairs	Faculty committees/ unions	Individual faculty	Students	Don'tKnow/Not applicable	
☐	☐	☐	☐	☐	☐	☐	Selecting key administrators
☐	☐	☐	☐	☐	☐	☐	Choosing new faculty
☐	☐	☐	☐	☐	☐	☐	Making faculty promotion and tenure decisions
☐	☐	☐	☐	☐	☐	☐	Determining budget priorities
☐	☐	☐	☐	☐	☐	☐	Determining the overall teaching load of faculty
☐	☐	☐	☐	☐	☐	☐	Setting admission standards for undergraduate students
☐	☐	☐	☐	☐	☐	☐	Approving new academic programs
☐	☐	☐	☐	☐	☐	☐	Evaluating teaching
☐	☐	☐	☐	☐	☐	☐	Setting internal research priorities
☐	☐	☐	☐	☐	☐	☐	Evaluating research
☐	☐	☐	☐	☐	☐	☐	Establishing international linkages

E2 ***How influential are you, personally, in helping to shape key academic policies?***

Very influential	Somewhat influential	A little influential	Not at all influential	Not applicable	
☐	☐	☐	☐	☐	At the level of the department or similar unit
☐	☐	☐	☐	☐	At the level of the faculty, school or similar unit
☐	☐	☐	☐	☐	At the institutional level

E3 ***By whom is your teaching, research, and service regularly evaluated?*** **[Mark all that apply]**

Your teaching	Your research	Your service	
1 ☐	1 ☐	1 ☐	Your peers in your department or unit
2 ☐	2 ☐	2 ☐	The head of your department or unit
3 ☐	3 ☐	3 ☐	Members of other departments or units at this institution
4 ☐	4 ☐	4 ☐	Senior administrative staff at this institution
5 ☐	5 ☐	5 ☐	Your students
6 ☐	6 ☐	6 ☐	External reviewers
7 ☐	7 ☐	7 ☐	Yourself (formal self-assessment)
8 ☐	8 ☐	8 ☐	No one at or outside my institution

E4 ***At my institution there is…***

Strongly agree				Strongly disagree		
1	2	3	4	5	Don't know/ Not Apply	
☐	☐	☐	☐	☐	☐	… A strong emphasis on the institution's mission
☐	☐	☐	☐	☐	☐	… Good communication between management and academics
☐	☐	☐	☐	☐	☐	… A top-down management style
☐	☐	☐	☐	☐	☐	… Collegiality in decision-making processes
☐	☐	☐	☐	☐	☐	… A strong performance orientation
☐	☐	☐	☐	☐	☐	… A cumbersome administrative process
☐	☐	☐	☐	☐	☐	… A supportive attitude of administrative staff towards teaching activities
☐	☐	☐	☐	☐	☐	… A supportive attitude of administrative staff towards research activities
☐	☐	☐	☐	☐	☐	…Training for administrative/management duties performed by individual faculty, e.g. chairs

E5 ***Please indicate your views on the following issues.***

Strongly agree 1	2	3	4	Strongly disagree 5	Don't know	
☐	☐	☐	☐	☐	☐	Top-level administrators are providing competent leadership
☐	☐	☐	☐	☐	☐	I am kept informed about what is going on at this institution
☐	☐	☐	☐	☐	☐	Lack of faculty involvement is a real problem here
☐	☐	☐	☐	☐	☐	Students should have a stronger voice in determining policy that affects them
☐	☐	☐	☐	☐	☐	The administration supports academic freedom

E6 ***To what extent does your institution emphasize the following practices?***

Very much 1	2	3	4	Not at all 5	Don't know	
☐	☐	☐	☐	☐	☐	Performance based allocation of resources to academic units
☐	☐	☐	☐	☐	☐	Funding of departments substantially based on numbers of students
☐	☐	☐	☐	☐	☐	Funding of departments substantially based on numbers of graduates
☐	☐	☐	☐	☐	☐	Considering the research quality when making personnel decisions
☐	☐	☐	☐	☐	☐	Considering the teaching quality when making personnel decisions
☐	☐	☐	☐	☐	☐	Considering the practical relevance/applicability of the work of colleagues when making personnel decisions
☐	☐	☐	☐	☐	☐	Recruiting faculty who have work experience outside of academia
☐	☐	☐	☐	☐	☐	Encouraging academics to adopt service activities/entrepreneurial activities outside the institution
☐	☐	☐	☐	☐	☐	Encouraging individuals, businesses, foundations etc. to contribute more to higher education

V. Career and Professional Situation

A1 ***For each of your degrees, please indicate the year in which the degree was awarded and whether the granting institution was in or outside the U.S.***

Degree	Year Granted	Earned in U.S.?	If "no,", please specify country where earned
Associate's Degree	_____	Yes ☐ No ☐	_____
First degree: Bachelor's	_____	Yes ☐ No ☐	_____
First Master's (if applicable)	_____	Yes ☐ No ☐	_____
Second Master's (if applicable)	_____	Yes ☐ No ☐	_____
Doctoral degree (if applicable)	_____	Yes ☐ No ☐	_____
Other advanced professional degree (if applicable) e.g. JD, MD, DDS, 2ND doctorate, Postdoctoral. Please insert name of degree [_____]	_____	Yes ☐ No ☐	_____ ...._____

A2 ***Please, identify the academic discipline or field of your highest degree, of the current primary academic department or unit with which you are affiliated, and of your current primary teaching focus.***

Highest Degree	Current Primary Acad. Unit	Current Primary Teaching Area	
1 ☐	1 ☐	1 ☐	Teacher Training and education science
2 ☐	2 ☐	2 ☐	Humanities and arts
3 ☐	3 ☐	3 ☐	Social and behavioral sciences
4 ☐	4 ☐	4 ☐	Business and administration, economics
5 ☐	5 ☐	5 ☐	Law
6 ☐	6 ☐	6 ☐	Life sciences
7 ☐	7 ☐	7 ☐	Physical sciences, mathematics, computer sciences
8 ☐	8 ☐	8 ☐	Engineering, manufacturing and construction, architecture
9 ☐	9 ☐	9 ☐	Agriculture
10 ☐	10 ☐	10 ☐	Medical sciences, health related sciences, social services
11 ☐	11 ☐	11 ☐	Personal services, transport services, security services
12 ☐	12 ☐	12 ☐	Other: (please specify).....
~~13~~ ☐	~~13~~ ☐	~~13~~ ☐	Not applicable

A3 ***If you indicated in A1 that you hold one or more doctoral degrees, how would you characterize the training you received in pursuing your first doctoral degree?*** **[**Mark all that apply]

1 ☐ You were required to take a prescribed core or set of courses

2 ☐ You were required to write a thesis or dissertation

3 ☐ You received intensive faculty guidance of your research

4 ☐ You chose your own research topic

5 ☐ You received a scholarship or fellowship

6 ☐ You received an employment contract during your studies (for teaching or research)

7 ☐ You received training in teaching methods

8 ☐ You participated in research projects (outside your dissertation) with faculty or senior researchers

9 ☐ You served on an institutional or departmental (unit) committee

9 ☐ Do not hold a doctoral degree

A4 ***Since your bachelor's degree, how many years have you been employed in the following sectors either full-time or part-time?*** **(Round to the nearest whole year; Enter "0" if you were never employed in that sector)**

Full time	Part time	
☐☐	☐☐	Higher education institutions
☐☐	☐☐	Private, non-profit institutions (outside higher education)
☐☐	☐☐	(Other) Government or public sector institutions
☐☐	☐☐	(Other) Business and industry (for-profit)
☐☐	☐☐	Self-employed

☐☐☐☐ If you reported some employment outside institutions of higher education, how many continuous (consecutive) years did you work in academe without interim phases of employment in other sectors?

A5 ***By how many separate institutions have you been employed since your …***

Bachelor's degree	Highest degree (beyond BA)	
☐☐	☐☐	Higher education institutions or research institutes
☐☐	☐☐	Other non-academic institutions

A6 ***Please indicate the following:***

☐☐☐☐ Year of your *first* full-time faculty appointment (beyond research and teaching assistant) in higher education

☐☐☐☐ Year of your first appointment to your current institution (beyond research and teaching assistant)

☐☐☐☐ Year of your appointment/promotion to your *current rank* at your current institution

☐☐ For how long have you interrupted your service <u>at your current institution</u> for family reasons, personal medical or family reasons or for full-time education? (if "0," so indicate; round to the next highest year)

A7 ***How would you best describe your employment situation at your institution during the current academic year?*** **(Mark one only)**

1 ☐ Full-time employed

2 ☐ Part-time employed, at ☐☐ % of full-time

3 ☐ Part-time with payment according to work tasks (e.g. courses taught)

4 ☐ Other (please specify).....

A8 ***Did you work for an additional employer or do additional outside remunerated work during the current academic year?***

1 ☐ No

2 ☐ In addition to your current employer, you also work at another research institute or higher education institution

3 ☐ In addition to your current employer, you also work at a business organization outside of academe

4 ☐ In addition to your current employer, you also work at a non-profit organization or government entity outside of academe

5 ☐ In addition to your current employer, you are also self-employed.

6 ☐ Other (please specify).....

A9 ***How would you describe your current institution?*** ***[Mark one only]***

☐ Public research university (extensive doctoral programs, professional schools including law and medicine and various research centers; multi-million dollars in federal research funds)

☐ Private research university (extensive doctoral programs, professional schools including law and medicine and various research centers; multi-million dollars in federal research funds)

☐ Public doctoral granting university (limited number of doctoral programs in a few fields; limited federal research funding)

☐ Private doctoral granting university (limited number of doctoral programs in a few fields; limited federal research funding)

☐ Public comprehensive college or university (no doctoral programs; Master's is highest degree offered)

☐ Private comprehensive college or university (no doctoral programs; Master's is highest degree offered)

☐ Public baccalaureate (Liberal Arts) college (no graduate programs)

☐ Private baccalaureate (Liberal Arts) college (no graduate programs)

☐ Public two-year, associate degree granting college

☐ Private two-year, associate degree granting college

A9A. **In what region of the country is your institution located?**

- ☐ Northeast
- ☐ Southeast
- ☐ Midwest
- ☐ Southwest (including Texas and Oklahoma)
- ☐ West

A10 ***What is your academic rank?*** **(If your institution does not have academic ranks, please choose the rank most closely corresponding to yours)**

1. ☐ Professor
2. ☐ Associate Professor
3. ☐ Assistant Professor
4. ☐ Instructor
5. ☐ Lecturer
6. ☐ Visiting professor
7. ☐ Clinical or Research professor
8. ☐ Other (please specify) .....

A11 ***What is the duration of your current employment contract at your institution?*** ***[Mark only one]***

1. ☐ Permanently employed (tenured)
2. ☐ Continuously employed (no preset term, but no guarantee of permanence)
3. ☐ Fixed-term employment *with* permanent/continuous employment prospects (tenure-track)
4. ☐ Fixed-term employment *without* permanent/continuous employment prospects (non-tenure eligible)
5. ☐ Other (please specify) .....

A12 ***What is your overall annual gross income (including supplements) from the following sources?*** **(Do not include commas in answer, enter whole numbers only)**

☐☐☐☐☐☐☐ Your current home institution (base salary plus any additional overload, stipends, etc)

☐☐☐☐☐☐☐ All other concurrent employers (including self-employment)

☐☐☐☐☐☐☐ Other income (investment income, spouse's income, etc)

1. ☐ I decline to answer

A13 ***During the current academic year, have you done any of the following?*** **(Mark all that apply)**

1 ☐ Served as a member of national/international scientific committees/boards/bodies

2 ☐ Served as a peer reviewer (e.g. for journals, research sponsors, institutional evaluations)

3 ☐ Served as an editor of journals/book series

4 ☐ Served as an elected officer or leader in professional/academic associations

5 ☐ Served as an elected officer or leader of unions

6 ☐ Participated in local, national or international politics

7 ☐ Served as a member of a community organization or participated in community-based projects

8 ☐ Worked with local, national or international social service agencies

9 ☐ Other (please specify):.....

9 ☐ None of the above

A14 ***Within the last five years, have you considered a major change in your job? Mark all changes that you considered in the 1st column. Then, for each change you considered, indicate in the 2nd column whether you took any concrete actions to make such a change?***

Considered	Concrete action taken? Yes	Concrete action taken? No	
1 ☐	1 ☐	1 ☐	Seeking a management position in your higher education/research institution
2 ☐	2 ☐	2 ☐	Seeking an academic position in another higher education/research institute within the U.S.
3 ☐	3 ☐	3 ☐	Seeking an academic position in another country
4 ☐	4 ☐	4 ☐	Seeking work outside higher education/research institutes
4 ☐	4 ☐	4 ☐	Retiring
5 ☐			No, I have not considered making any major changes in my job

VI. Personal Background and Professional Preparation

F1 ***What is your gender?***

1 ☐ Male

2 ☐ Female

F2 ***Year of birth***

☐☐☐☐ Year

F3 ***What is your familial status***

1 ☐ Married/partner

2 ☐ Single, never married **[SKIP TO F6]**

3 ☐ Single, divorced or widowed **[SKIP TO F6]**

4 ☐ Other (please specify) **[SKIP TO F6]** .....

F4 ***Is your spouse/partner employed?***

1 ☐ Yes, full-time

2 ☐ Yes, part-time

3 ☐ No [SKIP TO F6]

F5 ***Is your spouse/partner also an academic?***

1 ☐ Yes

2 ☐ No

F6 ***Do you have children under 18 living with you?***

1 ☐ Yes, 1 child

2 ☐ Yes, 2 children

3 ☐ Yes, 3 or more children

4 ☐ No

F7 ***Did you ever interrupt your employment in order to provide child or elder care in the home?***

1 ☐ Yes

2 ☐ No

If "yes,"

For how long did you interrupt your employment in order to provide child or elder care in the home? [Please enter number in both Years and Months as it applies to you].

ł [___ ___] Years [___ ___] Months

F8 ***What is your parents' highest, and if applicable, spouse' s/partner's highest education level?***

Father	Mother	Spouse or Partner	
1 ☐	1 ☐	1 ☐	Entered and/or completed a graduate degree
1 ☐	1 ☐	1 ☐	Entered and/or completed an Associate's or Baccalaureate degree
2 ☐	2 ☐	2 ☐	Entered and/or completed secondary education
3 ☐	3 ☐	3 ☐	Entered and/or completed primary education
4 ☐	4 ☐	4 ☐	No formal education
5 ☐	5 ☐	5 ☐	Not applicable/Don't know

F9 ***What was/is your country of citizenship and your country of residence at the following times?***

	Citizenship		Country of Residence	
	U.S	Non-U.S (please specify)	U.S	Non-U.S (please specify)
At birth	☐	☐ _____	☐	☐ _____
At the time of your bachelor's degree	☐	☐ _____	☐	☐ _____
Now	☐	☐ _____	☐	☐ _____

F10 ***What is your first language/mother tongue? If bilingual, which two?*** **[Mark one or two].**

- ☐ English
- ☐ Other, please check one
- ☐ Spanish
- ☐ French
- ☐ German
- ☐ Other western European (e.g. Italian, Dutch)
- ☐ Russian or other Slavic language
- ☐ Arabic, Hebrew or other Middle eastern language
- ☐ Chinese
- ☐ Japanese
- ☐ Other East Asian language
- ☐ Hindi or other South Asian language
- ☐ Native African language
- ☐ Other (please specify):

F11 ***Which language do you primarily employ in teaching?***

1 ☐ English

2 ☐ Other [please specify] .....

F12 ***Which language do you primarily employ in research?***

1 ☐ English

2 ☐ Other [please specify]

F13 ***How many years since the award of your bachelor's degree have you spent living and working …***

☐☐ In the United States

☐☐ In other countries (outside the United States)

F14 How would you describe your racial/ethnic background? (Please mark all that apply)

☐ White or Caucasian

☐ Black, African

☐ Black, African-American

☐ Caribbean Islands (Jamaica, Puerto Rico, Dominican Republic, Haiti, Trinidad,etc)

☐ Mexico or other Latin America

☐ Arab or other Middle-Eastern

☐ Chinese

☐ Japanese

☐ Korean

☐ Filipino or other Pacific Islander

☐ Southeast Asian (e.g., Cambodian, Indonesian, Laotian, Vietnamese, etc.)

☐ West Asian (Iranian, Afghan, Turkish)

☐ Aboriginal Peoples of North America (e.g., North American Indian, Métis, Inuit)

☐ Other (please specify

☐ Unknown

☐ Decline to answer

This is the end of the survey. Thank you for your time!
If you would like further information on the survey results as they become available, please e-mail your request to: finkelma@shu.edu.

Appendix C

Tables from Analysis

Table C.1

Correlations[b] of the five measures for teaching

	Teaching hours per week when classes are in session*	Teaching hours per week when classes are not in session*	Percent of undergraduate instruction time	Average number of undergraduates per course	Total teaching activities
Teaching hours per week when classes are in session*	1	.39**	.30**	.02	.21**
Teaching hours per week when classes are not in session*	.39**	1	.08**	-.02	.25**
Percent of undergraduate instruction time	.30**	.08**	1	.16**	.03
Average of undergraduates per course	.02	-.02	.16**	1	.03
Total teaching activities	.21**	.25**	.03	.03	1

* Teaching included preparation of instructional materials and lesson plans, classroom instruction, advising students, reading and evaluating student work.

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

b. Listwise N=1219

Table C.2

Correlation of seven research measures of faculty work

Correlations	Research hours per week when classes are in session*	Research hours per week when classes are not in session*	Percent of Peer-reviewed publications	Percent of the funding for your research from own institution	Percent of the funding for your research from gov't entities	Research and grant related activities	Log transformed Scholarly Contributions
Research hours per week when classes are in session*	1	.73**	.26**	-.09*	.30**	.43**	.40**
Research hours per week when classes are not in session*	.73**	1	.26**	-0.05	.19**	.29**	.33**
Percent of Peer-reviewed publications	.26**	.26**	1	-0.003	.25**	.33**	.29**
Percent of the funding for your research came from own institution	-.09*	-0.05	-0.003	1	-.45**	-.20**	-.14**
Percent of the funding for your research came from government entities	.30**	.19**	.25**	-.45**	1	.54**	.26**
Research and grant related activities	.43**	.29**	.33**	-.20**	.54**	1	.44**
Logarithmic transformed Scholarly Contributions	.40**	.33**	.29**	-.14**	.26**	.44**	1

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

* Correlation is significant at the 0.05 level (2-tailed).

c Listwise N=552

Table C.3

Correlation[c] of five measures of faculty service work

	Service hours per week when classes are in session	Service hours per week when classes are not in session	Administration hours per week when classes are in session	Administration hours per week when classes are not in session	Service related activities
Service hours per week when classes are in session	1	.79**	.07*	.06*	.26**
Service hours per week when classes are not in session	.79**	1	.08**	.11**	.26**
Administration hours per week when classes are in session	.07*	.08**	1	.81**	.16**
Administration hours per week when classes are not in session	.06*	.11**	.81**	1	.16**
Service related activities	.26**	.26**	.16**	.16**	1

* Correlation is significant at the 0.05 level (2-tailed).

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

c Listwise N=1245

Table C.4

Summary of ANOVA for the effect institutional type and market segment on the teaching measures

Source/ Measures	F	df(Effect)	df(Error)	Sig.	Partial η2
Institutional type (Carnegie)					
Teaching hours per week when classes are in session*	21.66	2	1291	<.001	.03
Teaching hours per week when classes are not in session*	6.98	2	1291	.001	.01
Percent of undergraduate instruction time	24.54	2	1291	<.001	.04
Total teaching activities	5.87	2	1291	.003	.01
Market segments					
Teaching hours per week when classes are in session*	5.62	2	1266	.004	.01
Teaching hours per week when classes are not in session*	5.01	2	1266	.007	.01
Percent of undergraduate instruction time	7.83	2	1266	<.001	.01
Total teaching activities	4.68	2	1266	.009	.01

* Teaching included preparation of instructional materials and lesson plans, classroom instruction, advising students, reading and evaluating student work.

Table C.5

Summary of marginal means for teaching measures by institutional type and market segment

				98.75% CI	
		M	SE	LL	UL
Teaching hours per week when classes are in session*	Research	20.46	0.61	18.94	21.98
	Doctoral/Masters	22.69	0.60	21.18	24.20
	Baccalaureate/Associate	25.87	0.57	24.46	27.29
Teaching hours per week when classes are not in session*	Research	6.22	0.34	5.37	7.06
	Doctoral/Masters	6.70	0.33	5.87	7.54
	Baccalaureate/Associate	7.87	0.31	7.09	8.66
Percent of undergraduate instruction time	Research	56.26	1.81	51.73	60.80
	Doctoral/Masters	68.93	1.80	64.43	73.44
	Baccalaureate/Associate	73.13	1.69	68.91	77.35
Total teaching activities	Research	6.66	0.09	6.44	6.87
	Doctoral/Masters	6.82	0.09	6.61	7.04
	Baccalaureate/Associate	7.06	0.08	6.86	7.26
Teaching hours per week when classes are in session*	Name Brand	22.21	0.78	20.27	24.16
	Core	22.21	0.58	20.76	23.67
	Convenience	24.57	0.53	23.25	25.89
Teaching hours per week when classes are not in session*	Name Brand	5.85	0.43	4.78	6.92
	Core	7.15	0.32	6.35	7.95
	Convenience	7.47	0.29	6.74	8.19
Percent of undergraduate instruction time	Name Brand	63.77	2.32	57.97	69.57
	Core	62.95	1.74	58.60	67.29
	Convenience	71.53	1.57	67.60	75.46
Total teaching activities	Name Brand	6.57	0.11	6.29	6.84
	Core	6.92	0.08	6.71	7.12
	Convenience	6.95	0.07	6.77	7.14

Note: CI = Confidence interval; LL =lower limit; UL = upper limit

* Teaching included preparation of instructional materials and lesson plans, classroom instruction, advising students, reading and evaluating student work.

Table C.6

Summary of multiple comparisons for teaching measures by institutional type

			Mean Difference	Std. Error	Sig.	98.75% CI LL	98.75% CI UL
Teaching hours per week when classes are in session*	Research	Doctoral/ Masters	-2.23	0.81	0.02	-4.53	0.08
	Baccalaureate/ Associate	Research	5.41**	0.84	0.00	3.03	7.80
		Doctoral/ Masters	3.19**	0.85	0.00	0.78	5.60
Teaching hours per week when classes are not in session*	Research	Doctoral/ Masters	-0.49	0.43	0.49	-1.70	0.73
	Baccalaureate/ Associate	Research	1.66**	0.47	0.00	0.31	3.01
		Doctoral/ Masters	1.17	0.47	0.03	-0.17	2.51
Percent of undergraduate instruction time	Research	Doctoral/ Masters	-0.16	0.12	0.37	-0.51	0.18
	Baccalaureate/ Associate	Research	0.40**	0.12	0.00	0.07	0.74
		Doctoral/ Masters	0.24	0.12	0.11	-0.10	0.57
Total teaching activities	Research	Doctoral/ Masters	-12.67**	2.56	0.00	-19.95	-5.39
	Baccalaureate/ Associate	Research	16.87**	2.54	0.00	9.64	24.10
		Doctoral/ Masters	4.20	2.41	0.19	-2.66	11.06

Note: CI= Confidence interval; LL = Lower limit; UL = Upper limit. Games-Howell Post hoc. Based on observed means. For Institutional type: MSE = 1343.684.

* Teaching included preparation of instructional materials and lesson plans, classroom instruction, advising students, reading and evaluating student work.
**. The mean difference is significant at the Bonferroni adjusted level of significance of 0.0125

Table C.7

Summary of multiple comparisons for teaching measures by market segment

			Mean Difference	Std. Error	Sig.	98.75% CI LL	98.75% CI UL
Teaching hours per week when classes are in session*	Name Brand	Core	0.00	0.95	1.00	-2.72	2.72
	Convenience	Name Brand	2.36	0.95	0.03	-0.34	5.06
		Core	2.36*	0.78	0.01	0.13	4.58
Teaching hours per week when classes are not in session*	Name Brand	Core	-1.30	0.47	0.02	-2.63	0.03
	Convenience	Name Brand	1.62*	0.47	0.00	0.28	2.95
		Core	0.32	0.45	0.76	-0.95	1.59
Percent of undergraduate instruction time	Name Brand	Core	0.82	2.97	0.96	-7.65	9.29
	Convenience	Name Brand	7.76	2.82	0.02	-0.30	15.81
		Core	8.58*	2.34	0.00	1.91	15.25
Total teaching activities	Name Brand	Core	-0.35	0.13	0.02	-0.72	0.01
	Convenience	Name Brand	0.39*	0.13	0.01	0.03	0.75
		Core	0.03	0.11	0.95	-0.28	0.35

Note: CI= Confidence interval; LL = Lower limit; UL = Upper limit. Games-Howell Post hoc. Based on observed means. For market segment: Mean Square (Error) = 3.042.

* Teaching included preparation of instructional materials and lesson plans, classroom instruction, advising students, reading and evaluating student work.

**. The mean difference is significant at the Bonferroni adjusted level of significance 0.0125

Table C.8

Summary of ANOVA for the effect institutional type and market segment on the research measures

Source/ Measures	F	df(Effect)	df(Error)	Sig.	Partial η^2
Institutional type (Carnegie)					
Research hours per week when classes are in session*	2.30	2	549	0.101	0.01
Research hours per week when classes are not in session*	4.02	2	549	0.019	0.01
Percent of Peer-reviewed publications	11.99	2	549	< 0.001	0.04
Percent of the funding for your research came from own institution	0.24	2	549	0.79	0.001
Percent of the funding for your research came from government entities	2.65	2	549	0.072	0.01
Research and grant related activities	4.49	2	549	0.012	0.02
Logarithmic transformed Scholarly Contributions	4.90	2	549	0.008	0.02
Market segments					
Research hours per week when classes are in session*	1.1	2	531	0.334	0.004
Research hours per week when classes are not in session*	2.39	2	531	0.093	0.009
Percent of Peer-reviewed publications	1.71	2	531	0.182	0.006
Percent of the funding for your research came from own institution	0.21	2	531	0.811	0.001
Percent of the funding for your research came from government entities	0.86	2	531	0.422	0.003
Research and grant related activities	0.02	2	531	0.979	0
Logarithmic transformed Scholarly Contributions	1.00	2	531	0.371	0.004

* Research includes reading literature, writing, conducting research, fieldwork

Table C.9

Summary of marginal means for research measures by institutional type and market segment

				98.75% CI	
		M	SE	LL	UB
Research hours per week when classes are in session*	Research	16.75	0.77	14.71	18.79
	Doctoral/Masters	14.57	0.77	12.51	16.63
	Baccalaureate/Associate	14.92	0.92	12.46	17.38
Research hours per week when classes are not in session*	Research	26.51	0.98	23.89	29.13
	Doctoral/Masters	24.77	0.99	22.13	27.42
	Baccalaureate/Associate	22.49	1.19	19.34	25.65
Percent of Peer-reviewed publications	Research	66.04	3.05	57.94	74.15
	Doctoral/Masters	57.44	3.08	49.25	65.62
	Baccalaureate/Associate	44.08	3.67	34.31	53.84
Percent of the funding for your research came from government entities	Research	32.95	2.65	25.90	40.00
	Doctoral/Masters	28.48	2.67	21.36	35.60
	Baccalaureate/Associate	24.25	3.19	15.75	32.74
Research and grant related activities	Research	4.16	0.14	3.80	4.52
	Doctoral/Masters	3.67	0.14	3.31	4.04
	Baccalaureate/Associate	3.64	0.16	3.20	4.07
Logarithmic transformed Scholarly Contributions	Research	2.50	0.07	2.33	2.67
	Doctoral/Masters	2.30	0.07	2.13	2.48
	Baccalaureate/Associate	2.21	0.08	2.00	2.41

Note: M = Mean, SE = Standard Error, CI = Confidence interval; LL =lower limit; UL = upper limit

* Research includes reading literature, writing, conducting research, fieldwork

Table C.10

Summary of multiple comparisons for research measures by institutional type

						99.2% CI	
			MD	SE	Sig.	LL	UL
Research hours per week when classes are in session*	Research	Doctoral/Masters	2.18	1.04	0.09	-0.93	5.29
	Baccalaureate/ Associate	Research	-1.83	1.26	0.32	-5.63	1.96
		Doctoral/Masters	0.35	1.29	0.96	-3.54	4.23
Research hours per week when classes are not in session*	Research	Doctoral/Masters	1.74	1.38	0.42	-2.41	5.88
	Baccalaureate/ Associate	Research	-4.02	1.53	0.03	-8.63	0.59
		Doctoral/Masters	-2.28	1.61	0.33	-7.11	2.55
Percent of Peer-reviewed publications	Research	Doctoral/Masters	8.60	4.31	0.11	-4.33	21.54
	Baccalaureate/ Associate	Research	21.97*	4.73	< 0.001	-36.19	-7.75
		Doctoral/Masters	-13.36	4.89	0.02	-28.07	1.34
Percent of the funding for your research came from government entities	Research	Doctoral/Masters	4.47	3.84	0.48	-7.06	16.00
	Baccalaureate/ Associate	Research	-8.70	4.08	0.08	-20.95	3.55
		Doctoral/Masters	-4.23	4.00	0.54	-16.26	7.79
Research and grant related activities	Research	Doctoral/Masters	0.48	0.19	0.03	-0.087	1.05
	Baccalaureate/ Associate	Research	-0.52	0.21	0.04	-1.17	0.13
		Doctoral/Masters	-0.04	0.22	0.99	-0.69	0.62
Logarithmic transformed Scholarly Contributions	Research	Doctoral/Masters	0.20	0.09	0.07	-0.07	0.47
	Baccalaureate/ Associate	Research	-0.29	0.10	0.01	-0.61	0.02
		Doctoral/Masters	-0.10	0.10	0.63	-0.41	0.22

Note: MD = Mean Difference, SE = Standard error, CI= Confidence interval; LL = Lower limit; UL = Upper limit. Games-Howell Post hoc. Based on observed means. For Institutional type: Mean Square (Error) = 0.887.

*. The mean difference is significant at the Bonferroni adjusted level of significance of 0.008

Table C.11

Summary of ANOVA for the effect institutional type and market segment on the service measures

Source/ Measures	F	df(Effect)	df(Error)	Sig.	Partial η^2
Institutional type (Carnegie)					
Service hours per week when classes are in session*	5.15	2	1242	0.006	0.008
Service hours per week when classes are not in session*	3.02		1242	0.049	0.005
Administration hours per week when classes are in session**	1.45	2	1242	0.235	0.002
Administration hours per week when classes are not in session**	2.24	2	1242	0.107	0.004
Service related activities	5.00	2	1242	0.007	0.008
Market segments					
Service hours per week when classes are in session*	4.55	2	1218	0.011	0.007
Service hours per week when classes are not in session*	3.87	2	1218	0.021	0.006
Administration hours per week when classes are in session**	5.45	2	1218	0.004	0.009
Administration hours per week when classes are not in session**	4.35	2	1218	0.013	0.007
Service related activities	0.38	2	1218	0.686	0.001

* Includes services to clients and/or patients, unpaid consulting, public or voluntary services

** Included committees, department meetings, paperwork

Table C.12

Summary of marginal means for service measures by institutional type and market segment

				99% CI	
		M	SE	LL	UL
Service hours per week when classes are in session*	Research	4.90	0.28	4.19	5.61
	Doctoral/Masters	4.62	0.27	3.91	5.32
	Baccalaureate/Associate	3.75	0.26	3.09	4.41
Service hours per week when classes are not in session*	Research	5.03	0.31	4.21	5.84
	Doctoral/Masters	5.03	0.31	4.23	5.84
	Baccalaureate/Associate	4.13	0.29	3.37	4.88
Administration hours per week when classes are in session**	Research	7.66	0.37	6.70	8.62
	Doctoral/Masters	7.49	0.37	6.53	8.44
	Baccalaureate/Associate	6.85	0.35	5.96	7.74
Administration hours per week when classes are not in session**	Research	5.88	0.39	4.87	6.88
	Doctoral/Masters	5.02	0.39	4.02	6.02
	Baccalaureate/Associate	4.79	0.36	3.86	5.73
Service related activities	Research	2.32	0.08	2.12	2.52
	Doctoral/Masters	2.22	0.08	2.03	2.42
	Baccalaureate/Associate	2.00	0.07	1.81	2.18
Service hours per week when classes are in session*	Name Brand	4.71	0.35	3.81	5.62
	Core	4.81	0.26	4.14	5.49
	Convenience	3.83	0.24	3.22	4.44
Service hours per week when classes are not in session*	Name Brand	5.05	0.40	4.02	6.08
	Core	5.16	0.30	4.39	5.93
	Convenience	4.12	0.27	3.42	4.82
Administration hours per week when classes are in session**	Name Brand	7.68	0.47	6.47	8.90
	Core	8.05	0.35	7.15	8.96
	Convenience	6.55	0.32	5.73	7.37
Administration hours per week when classes are not in session**	Name Brand	5.66	0.49	4.39	6.93
	Core	5.84	0.37	4.89	6.78
	Convenience	4.47	0.33	3.61	5.33
Service related activities	Name Brand	2.17	0.10	1.91	2.42
	Core	2.21	0.07	2.02	2.40
	Convenience	2.12	0.07	1.95	2.29

Note: CI = Confidence interval; LL =lower limit; UL = upper limit

* Includes services to clients and/or patients, unpaid consulting, public or voluntary services

** Included committees, department meetings, paperwork

Table C.13

Summary of multiple comparisons for service measures by institutional type

						99% CI	
			MD	SE	Sig.	LL	UL
Service hours per week when classes are in session	Research	Doctoral/Masters	0.28	0.41	0.77	-0.92	1.48
	Baccalaureate/ Associate	Research	-1.14	0.40	0.01	-2.31	0.02
		Doctoral/Masters	-0.86	0.34	0.03	-1.85	0.12
Service hours per week when classes are not in session	Research	Doctoral/Masters	0.00	0.48	1.00	-1.40	1.39
	Baccalaureate/ Associate	Research	-0.90	0.41	0.08	-2.10	0.30
		Doctoral/Masters	-0.90	0.43	0.09	-2.15	0.34
Administration hours per week when classes are in session	Research	Doctoral/Masters	0.18	0.53	0.94	-1.37	1.73
	Baccalaureate/ Associate	Research	-0.8	0.53	0.27	-2.35	0.72
		Doctoral/Masters	-0.63	0.48	0.39	-2.05	0.78
Administration hours per week when classes are not in session	Research	Doctoral/Masters	0.85	0.56	0.28	-2.480	0.78
	Baccalaureate/ Associate	Research	-1.08	0.55	0.12	-2.69	0.53
		Doctoral/Masters	-0.23	0.51	0.89	-1.71	1.25
Service related activities	Research	Doctoral/Masters	0.09	0.11	0.67	-0.41	0.23
	Baccalaureate/ Associate	Research	-.32*	0.11	0.01	-0.63	-0.02
		Doctoral/Masters	-0.23	0.11	0.08	-0.54	0.08

Note: MD = Mean Difference, SE = Standard Error, CI= Confidence interval; LL = Lower limit; UL = Upper limit. Games-Howell Post hoc. Based on observed means. For Institutional type: Mean Square (Error) = 2.338.

*. The mean difference is significant at the Bonferroni adjusted level of significance of 0.01

Table C.14

Summary of multiple comparisons for service measures by market segment

						99% CI	
			MD	SE	Sig.	LL	UL
Service hours per week when classes are in session	Name Brand	Core	-0.10	0.49	0.98	-1.54	1.33
	Convenience	Name Brand	-0.88	0.46	0.13	-2.22	0.45
		Core	-0.99	0.34	0.01	-1.99	0.01
Service hours per week when classes are not in session	Name Brand	Core	-0.11	0.55	0.98	-1.72	1.50
	Convenience	Name Brand	-0.93	0.49	0.14	-2.36	0.50
		Core	-1.04	0.41	0.03	-2.22	0.15
Administration hours per week when classes are in session	Name Brand	Core	-0.37	0.61	0.82	-2.14	1.41
	Convenience	Name Brand	-1.14	0.54	0.09	-2.72	0.44
		Core	-1.51*	0.49	0.01	-2.93	-0.09
Administration hours per week when classes are not in session	Name Brand	Core	-0.18	0.66	0.96	-2.12	1.76
	Convenience	Name Brand	-1.19	0.61	0.13	-2.98	0.60
		Core	-1.37	0.49	0.02	-2.80	0.07
Service related activities	Name Brand	Core	-0.04	0.12	0.94	-0.39	0.30
	Convenience	Name Brand	-0.04	0.12	0.92	-0.38	0.29
		Core	-0.09	0.10	0.67	-0.38	0.21

Note: MD = Mean Difference, SE = Standard Error, CI= Confidence interval; LL = Lower limit; UL = Upper limit. Games-Howell Post hoc. Based on observed means. For market segment: Mean Square (Error) = 2.357.

*. The mean difference is significant at the Bonferroni adjusted level of significance of 0.01

Table C.15

Summary of the effect of discipline on teaching variables

	Soft discipline		Hard discipline				98.75% CI		Cohen's d
	M	SD	M	SD	t(1245)	p	LL	UL	
Teaching hours per week when classes are in session*	24.21	12.27	21.37	12.49	3.93	< 0.001	1.02	4.65	-0.26
Teaching hours per week when classes are not in session*	6.97	6.82	6.66	6.67	0.82	0.410	-0.65	1.28	0.05
Percent of undergraduate instruction time	69.36	38.28	62.65	36.18	3.11	0.002	1.31	12.11	0.18
Total teaching activities	6.78	1.67	7.00	1.85	-2.11	0.035	-0.47	0.04	-0.13

Note: CI = Confidence interval of the difference; LL = Lower limit, UL = Upper limit; Bonferroni adjusted level of significance of 0.0125

* Teaching included preparation of instructional materials and lesson plans, classroom instruction, advising students, reading and evaluating student work.

Table C.16

Summary of effects of discipline on research measures

	Soft discipline		Hard discipline				99.2% CI		
	M	SD	M	SD	t(1245)	p	LL	UL	Cohen's d
Research hours per week when classes are in session*	10.65	9.03	12.56	11.83	-3.21	0.001	-3.48	-0.33	-0.18
Research hours per week when classes are not in session*	19.07	14.10	19.34	15.99	-0.31	0.754	-2.28	1.99	-0.02
Percent of Peer-reviewed publications	48.33	45.10	63.48	43.96	-5.04	< 0.001	-23.15	-7.17	-0.43
Percent of the funding for your research came from government entities	13.27	29.51	47.66	39.62	-12.82	< 0.001	-41.52	-27.25	-0.98
Research and grant related activities	2.64	1.58	4.59	1.93	-16.82	< 0.001	-2.26	-1.64	-1.11
Logarithmic transformed Scholarly Contributions	2.04	0.98	2.21	1.16	-2.53	0.011	-0.34	0.01	-0.16
Scholarly Contributions (untransformed)	12.32	22.80	17.46	34.96					

Note: CI = Confidence interval of the difference; LL =lower limit; UL = Upper limit; Bonferroni adjusted level of significance of 0.008

* Research includes reading literature, writing, conducting research, fieldwork

Table C.17

Summary of effects of discipline on service measures

	Soft discipline		Hard discipline				99% CI		Cohen's
	M	SD	M	SD	t(1245)	p	LL	UL	d
Service hours per week when classes are in session*	3.91	4.28	5.12	6.87	-3.836	< 0.001	-2.03	-0.40	-0.21
Service hours per week when classes are not in session*	4.30	5.88	5.65	7.44	-3.591	< 0.001	-2.31	-0.38	-0.20
Administration hours per week when classes are in session**	7.13	7.14	7.31	7.47	-0.435	0.664	-1.28	0.91	-0.03
Administration hours per week when classes are not in session**	4.88	7.91	6.15	7.93	-2.811	0.005	-2.45	-0.11	-0.16
Service related activities	2.15	1.57	2.24	1.51	-1.002	0.317	-0.32	0.14	-0.06

Note: CI = Confidence interval of the difference; LL =lower limit; UL = Upper limit; Bonferroni adjusted level of significance of 0.01

* Includes services to clients and/or patients, unpaid consulting, public or voluntary services

** Included committees, department meetings, paperwork

Table C.18

Summary of ANOVA for the interaction effect of discipline with institutional type on the service measures

Source/ Measures	F	df(Effect)	df(Error)	Sig.	Partial η^2
Discipline with Institutional type					
Service hours per week when classes are in session*	5.72	2	1192	0.003	0.010
Service hours per week when classes are not in session*	2.96	2	1192	0.052	0.005
Administration hours per week when classes are in session**	0.61	2	1192	0.542	0.001
Administration hours per week when classes are not in session**	1.33	2	1192	0.264	0.002
Service related activities	0.36	2	1192	0.696	0.001

Note: Bonferroni adjusted level of significance of 0.01

* Includes services to clients and/or patients, unpaid consulting, public or voluntary services

** Included committees, department meetings, paperwork

Table C.19

Summary of the effect of gender on teaching variables

	Male		Female				98.75% CI		Cohen's
	M	SD	M	SD	t(1241)	p	LL	UL	d
Teaching hours per week when classes are in session*	21.83	11.91	24.77	12.63	-4.21	< 0.001**	-4.69	-1.19	-0.24
Teaching hours per week when classes are not in session*	6.39	6.68	7.48	6.94	-2.85	0.005**	-2.04	-0.13	-0.16
Percent of undergraduate instruction time	67.16	35.68	65.51	39.22	0.77	0.440	-3.68	6.97	0.04
Total teaching activities	6.59	1.78	7.16	1.68	-5.81	< 0.001**	-0.82	-0.33	-0.33

Note: CI = Confidence interval of the difference; LL = Lower limit, UL = Upper limit

* Teaching included preparation of instructional materials and lesson plans, classroom instruction, advising students, reading and evaluating student work.

**Significant at 0.0125

Table C.20

Summary of ANOVA for the interaction effect gender with discipline on the teaching measures

Source/ Measures	F	df(Effect)	df(Error)	Sig.	Partial η^2
Gender with Discipline					
Teaching hours per week when classes are in session*	8.28	1	1192	0.004**	.007
Teaching hours per week when classes are not in session*	6.59	1	1192	0.01**	.005
Percent of undergraduate instruction time	2.31	1	1192	.129	.002
Total teaching activities	7.04	1	1192	0.008**	.006

* Teaching included preparation of instructional materials and lesson plans, classroom instruction, advising students, reading and evaluating student work.

** Bonferroni adjusted level of significant at 0.0125

Table C.21

Summary of marginal means for teaching measures by gender with discipline

					98.75% CI	
Measure	Gender	Discipline	M	SE	LB	UB
Teaching hours per week when classes are in session*	Male	Soft discipline	23.71	0.61	22.19	25.22
		Hard discipline	19.07	0.73	17.24	20.89
	Female	Soft discipline	24.93	0.64	23.32	26.54
		Hard discipline	24.49	0.90	22.23	26.75
Teaching hours per week when classes are not in session*	Male	Soft discipline	6.72	0.34	5.89	7.56
		Hard discipline	5.69	0.40	4.68	6.70
	Female	Soft discipline	7.26	0.36	6.37	8.15
		Hard discipline	8.30	0.50	7.05	9.55
Percent of undergraduate instruction time	Male	Soft discipline	71.76	1.86	67.11	76.41
		Hard discipline	61.49	2.23	55.90	67.08
	Female	Soft discipline	66.97	1.97	62.03	71.90
		Hard discipline	63.49	2.77	56.57	70.41
Total teaching activities	Male	Soft discipline	6.57	0.09	6.35	6.78
		Hard discipline	6.60	0.10	6.34	6.86
	Female	Soft discipline	7.00	0.09	6.77	7.23
		Hard discipline	7.58	0.13	7.26	7.91

* Teaching included preparation of instructional materials and lesson plans, classroom instruction, advising students, reading and evaluating student work.

Note: CI = Confidence interval; LB =lower bound; UB = upper bound

Table C.22

Summary of effects of gender on research measures

	Male		Female				99.2% CI		
	M	SD	M	SD	t	p	LL	UL	Cohen's d
Research hours per week when classes are in session*	12.87	10.49	9.34	9.17	6.23	< 0.001	2.03	5.04	0.36
Research hours per week when classes are not in session*	20.74	15.09	16.88	14.15	4.68	< 0.001	1.67	6.06	0.26
Percent of Peer-reviewed publications	58.35	44.64	46.98	45.52	3.75	< 0.001	3.30	19.44	0.25
Percent of the funding for your research came from government entities	32.83	39.9	22.17	34.95	3.51	< 0.001	2.57	18.76	0.28
Research and grant related activities	3.47	2.00	3.16	1.87	2.46	0.014	-0.03	0.66	0.16
Logarithmic transformed Scholarly Contributions	2.70	1.05	1.97	1.04	3.04	0.002	0.02	0.37	0.70
Scholarly Contributions (untransformed)	15.32	28.98	12.29	26.41					

Note: CI = Confidence interval of the difference; LL =lower limit; UL = Upper limit; Bonferroni adjusted level of significance of 0.008

* Research includes reading literature, writing, conducting research, fieldwork

Table C.23

Summary of ANOVA for the effect appointment type on the research measures

Source/ Measures	F	df(Effect)	df(Error)	Sig.	Partial η^2
Appointment Type					
Research hours per week when classes are in session*	2.38	2	538	0.094	0.009
Research hours per week when classes are not in session*	9.69	2	538	< 0.001**	0.035
Percent of Peer-reviewed publications	6.49	2	538	0.002**	0.024
Percent of the funding for your research came from government entities	3.91	2	538	0.021	0.014
Research and grant related activities	1.41	2	538	0.244	0.005
Logarithmic transformed Scholarly Contributions	0.87	2	538	0.419	0.003

* Research includes reading literature, writing, conducting research, fieldwork
** Significant at Bonferroni adjusted level of significance of 0.008

Table C.24

Summary of marginal means for research measures by appointment type

				98.75% CI	
		M	SE	LL	UL
Research hours per week when classes are in session*	Tenured	15.05	0.60	13.46	16.64
	Tenure-track	17.12	0.98	14.50	19.74
	Non-tenure/No tenure	14.00	1.22	10.74	17.26
Research hours per week when classes are not in session*	Tenured	24.08	0.77	22.05	26.12
	Tenure-track	29.11	1.26	25.75	32.47
	Non-tenure/No tenure	20.74	1.57	16.56	24.92
Percent of Peer-reviewed publications	Tenured	60.54	2.43	54.07	67.01
	Tenure-track	61.27	4.01	50.60	71.93
	Non-tenure/No tenure	41.53	4.99	28.25	54.80
Percent of the funding for your research came from government entities	Tenured	32.75	2.10	27.16	38.35
	Tenure-track	21.90	3.46	12.68	31.12
	Non-tenure/No tenure	26.31	4.31	14.83	37.79
Research and grant related activities	Tenured	3.95	0.11	3.66	4.23
	Tenure-track	3.78	0.18	3.31	4.26
	Non-tenure/No tenure	3.55	0.22	2.96	4.14
Logarithmic transformed Scholarly Contributions	Tenured	2.39	0.05	2.25	2.52
	Tenure-track	2.32	0.09	2.10	2.55
	Non-tenure/No tenure	2.24	0.11	1.96	2.52

Note: CI = Confidence interval; LL =lower limit; UL = upper limit

* Research includes reading literature, writing, conducting research, fieldwork

Table C.25

Summary of multiple comparisons for research measures by appointment type

			MD	SE	Sig.	99.2% CI	
						LB	UB
Research hours per week when classes are in session	Tenured	Tenure-track	-2.07	1.23	0.212	-5.77	1.63
	Non-tenure/ No tenure	Tenured	-1.05	1.40	0.733	-5.31	3.21
		Tenure-track	-3.12	1.68	0.153	-8.19	1.95
Research hours per week when classes are not in session	Tenured	Tenure-track	-5.03*	1.55	0.004	-9.71	-0.35
	Non-tenure/ No tenure	Tenured	-3.35	1.72	0.131	-8.59	1.90
		Tenure-track	-8.38*	2.06	0.000	-14.62	-2.13
Percent of Peer-reviewed publications	Tenured	Tenure-track	-0.72	4.66	0.987	-14.78	13.33
	Non-tenure/ No tenure	Tenured	-19.02*	5.74	0.004	-36.52	-1.51
		Tenure-track	-19.74	6.57	0.009	-39.63	0.15
Percent of the funding for your research came from government entities	Tenured	Tenure-track	10.85	3.83	0.014	-0.69	22.39
	Non-tenure/ No tenure	Tenured	-6.44	4.76	0.368	-20.91	8.03
		Tenure-track	4.41	5.27	0.681	-11.57	20.39
Research and grant related activities	Tenured	Tenure-track	0.16	0.21	0.720	-0.48	0.81
	Non-tenure/ No tenure	Tenured	-0.40	0.24	0.228	-1.13	0.33
		Tenure-track	-0.23	0.28	0.690	-1.09	0.62
Logarithmic transformed Scholarly Contributions	Tenured	Tenure-track	0.06	0.09	0.757	-0.20	0.33
	Non-tenure/ No tenure	Tenured	-0.15	0.13	0.478	-0.53	0.24
		Tenure-track	-0.08	0.14	0.811	-0.49	0.33

Note: MD = Mean Difference; CI= Confidence interval of the difference; LL = Lower limit; UL = Upper limit. Games-Howell Post hoc. Based on observed means. For Appointment Type: Mean Square (Error) = 0.896.
*. Significant at the Bonferroni adjusted level of significance of 0.008

Table C.26

Summary of ANOVA for the effect of appointment type and interaction effect of appointment type with discipline on the service measures

Source/ Measures	F	df(Effect)	df(Error)	Sig.	Partial η^2
Appointment Type					
Service hours per week when classes are in session*	2.61	2	1214	0.074	0.004
Service hours per week when classes are not in session*	6.49	2	1214	0.002	0.011
Administration hours per week when classes are in session**	18.51	2	1214	< 0.001	0.030
Administration hours per week when classes are not in session**	12.23	2	1214	< 0.001	0.020
Service related activities	14.22	2	1214	< 0.001	0.023
Appointment Type with Discipline					
Service hours per week when classes are in session*	8.21	2	1165	< 0.001	0.014
Service hours per week when classes are not in session*	4.77	2	1165	0.009	0.008
Administration hours per week when classes are in session**	1.34	2	1165	0.263	0.002
Administration hours per week when classes are not in session**	1.07	2	1165	0.344	0.002
Service related activities	0.84	2	1165	0.431	0.001

Note: Significant at Bonferroni adjusted level of significance of 0.01

* Includes services to clients and/or patients, unpaid consulting, public or voluntary services

** Included committees, department meetings, paperwork

Table C.27

Summary of marginal means for service measures by appointment type

				99% CI	
		M	SE	LL	UL
Service hours per week when classes are in session*	Tenured	4.47	0.20	3.94	4.99
	Tenure-track	3.71	0.34	2.83	4.60
	Non-tenure/No tenure	4.76	0.34	3.89	5.63
Service hours per week when classes are not in session*	Tenured	4.58	0.23	3.98	5.18
	Tenure-track	3.87	0.39	2.86	4.87
	Non-tenure/No tenure	5.80	0.39	4.81	6.80
Administration hours per week when classes are in session**	Tenured	8.30	0.28	7.59	9.01
	Tenure-track	5.06	0.46	3.88	6.25
	Non-tenure/No tenure	7.01	0.46	5.83	8.18
Administration hours per week when classes are not in session**	Tenured	5.81	0.29	5.06	6.56
	Tenure-track	3.08	0.49	1.83	4.34
	Non-tenure/No tenure	5.69	0.48	4.46	6.93
Service related activities	Tenured	2.37	0.06	2.22	2.52
	Tenure-track	1.90	0.10	1.65	2.15
	Non-tenure/No tenure	1.90	0.10	1.65	2.14

Note: CI = Confidence interval; LL =lower limit; UL = upper limit

* Includes services to clients and/or patients, unpaid consulting, public or voluntary services

** Included committees, department meetings, paperwork

Table C.28

Summary of multiple comparisons for service measures by appointment type

						99% CI	
			MD	SE	Sig.	LL	UL
Appointment Type	Tenured	Tenure-track	0.75	0.33	0.06	-0.20	1.70
	Non-tenure/No tenure	Tenured	0.29	0.48	0.81	-1.10	1.68
		Tenure-track	1.05	0.50	0.10	-0.43	2.52
Service hours per week when classes are not in session	Tenured	Tenure-track	0.71	0.35	0.10	-0.31	1.74
	Non-tenure/No tenure	Tenured	1.22	0.60	0.11	-0.54	2.98
		Tenure-track	1.94*	0.63	0.01	0.08	3.79
Administration hours per week when classes are in session	Tenured	Tenure-track	3.23*	0.37	< 0.001	2.16	4.31
	Non-tenure/No tenure	Tenured	-1.29	0.62	0.10	-3.11	0.53
		Tenure-track	1.94*	0.60	< 0.001	0.19	3.69
Administration hours per week when classes are not in session	Tenured	Tenure-track	2.73*	0.38	< 0.001	1.61	3.85
	Non-tenure/No tenure	Tenured	-0.12	0.65	0.98	-2.01	1.77
		Tenure-track	2.61*	0.61	< 0.001	0.82	4.40
Service related activities	Tenured	Tenure-track	.4684*	0.11	< 0.001	0.16	0.78
	Non-tenure/No tenure	Tenured	-.4738*	0.11	< 0.001	-0.81	-0.14
		Tenure-track	-0.01	0.13	1.00	-0.39	0.38

Note: MD = Mean Difference; CI= Confidence interval of the difference; LL = Lower limit; UL = Upper limit. Games-Howell Post hoc. Based on observed means. For Appointment Type: Mean Square (Error) = 02.312.

*. Significant at the Bonferroni adjusted level of significance of 0.01

Table C.29

Summary of marginal means for service measures by appointment type with discipline

					99% CI	
			M	SE	LL	UL
Service hours per week when classes are in session*	Tenured	Soft discipline	4.09	0.26	3.41	4.77
		Hard discipline	5.00	0.33	4.16	5.85
	Tenure-track	Soft discipline	3.72	0.42	2.63	4.81
		Hard discipline	3.84	0.60	2.31	5.38
	Non-tenure/No tenure	Soft discipline	3.47	0.44	2.34	4.60
		Hard discipline	7.35	0.56	5.89	8.81
Service hours per week when classes are not in session*	Tenured	Soft discipline	4.17	0.30	3.39	4.95
		Hard discipline	5.18	0.38	4.21	6.15
	Tenure-track	Soft discipline	3.68	0.48	2.44	4.93
		Hard discipline	4.40	0.68	2.65	6.16
	Non-tenure/No tenure	Soft discipline	4.60	0.50	3.31	5.90
		Hard discipline	8.36	0.65	6.70	10.03
Administration hours per week when classes are in session**	Tenured	Soft discipline	8.34	0.35	7.43	9.26
		Hard discipline	8.22	0.44	7.08	9.35
	Tenure-track	Soft discipline	5.23	0.57	3.77	6.69
		Hard discipline	4.87	0.80	2.81	6.92
	Non-tenure/No tenure	Soft discipline	6.18	0.59	4.66	7.70
		Hard discipline	7.74	0.76	5.78	9.69
Administration hours per week when classes are not in session**	Tenured	Soft discipline	5.59	0.37	4.63	6.55
		Hard discipline	6.13	0.46	4.93	7.32
	Tenure-track	Soft discipline	2.80	0.59	1.27	4.33
		Hard discipline	3.79	0.84	1.63	5.95
	Non-tenure/No tenure	Soft discipline	4.64	0.62	3.04	6.23
		Hard discipline	6.88	0.79	4.83	8.93
Service related activities	Tenured	Soft discipline	2.34	0.07	2.14	2.53
		Hard discipline	2.42	0.09	2.18	2.66
	Tenure-track	Soft discipline	1.95	0.12	1.64	2.26
		Hard discipline	1.78	0.17	1.35	2.22
	Non-tenure/No tenure	Soft discipline	1.85	0.12	1.53	2.17
		Hard discipline	2.04	0.16	1.63	2.46

Note: CI = Confidence interval; LL =lower limit; UL = upper limit

* Includes services to clients and/or patients, unpaid consulting, public or voluntary services

** Included committees, department meetings, paperwork