

Examining the Relationship between Faculty Productivity and Job Satisfaction

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***Abstract:** In this study, we used the 2004 National Study of Postsecondary Faculty dataset to conceptualize and examine how faculty productivity in the areas of research, teaching, and service related to their job satisfaction at research universities. The theoretical rationale for productivity-job satisfaction relationship was grounded in expectancy-based and self-determination theories of motivation. The findings from this secondary data analysis, using structural equation modeling, indicated that increased undergraduate teaching and service productivity was significantly and negatively related to faculty job satisfaction. Higher education institutions need to rethink their reward structures, value systems, and expectations placed on faculty work in order to keep productive faculty satisfied with their jobs, and provide them with the workplace that is more appealing and attractive.*

Recent calls for faculty performance accountability and productivity have placed increasing demands on faculty work. Academics are expected to teach, conduct research, and be involved in service and administrative functions of their institutions and professions (e.g., Blackburn & Lawrence, 1995; Boyer, 1990; Gappa, Austin, & Trice, 2007; Jacobs & Winslow, 2004; Schuster & Finkelstein, 2006). There is a significant variation in faculty work across institutions and disciplines, but regardless of the environment, there are always too many

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responsibilities that are competing for faculty members' time (e.g., Fairweather, 2002, 2005; Schuster & Finkelstein, 2006). The research on faculty productivity reveals that today's academics face growing demands that make it harder for them to achieve the balance among various functions of their work (e.g., Bellas & Toutkoushian, 1999; Fairweather, 1993, 2002; 2005; Fairweather & Beach, 2002; Fox, 1992; Hattie & Marsh, 1996; Houston, Meyer, & Paewai, 2006; Porter & Umbach, 2001). Faculty work long hours, but despite these long hours, they find it difficult to balance the increasing expectations of their work that are becoming "more demanding in terms of effort as well as time" (Jacobs & Winslow, 2004, p. 106).

Increased expectations for faculty performance accountability raise questions about how these growing pressures affect faculty members' job experiences and attitudes. What aspects of faculty work lead to job satisfaction? Are more productive faculty more satisfied with their jobs? Or as the pressures and demands to perform increase, do faculty feel less happy and satisfied? Productive and satisfied faculty is the most important resource for today's universities (Gappa et al., 2007). Given the increased emphasis on faculty performance accountability and the concern for the well-being of the professoriate, it is important to understand the relationship between faculty members' productivity and job satisfaction. The current study intended to address this question and examine how faculty members' productivity affected their job satisfaction. More specifically, the purpose of the study was to conceptualize and measure faculty productivity and job satisfaction at research universities and to examine how faculty productivity in the areas of research, teaching, and service related to their job satisfaction.

Theoretical Framework

The relationship between job satisfaction and job productivity has been of continuous interest in organizational and social psychology literature (Judge, Bono, Thoresen, & Patton, 2001). Early studies were based on the assumption that individuals increased their productivity as a result of increased job satisfaction (Gruneberg, 1979; Herzberg, Mausner, & Snyderman, 1959). This direction of the relationship was attributed to human relations movement that assumed that higher morale and satisfaction would lead to improved productivity (Judge et al., 2001). This assumption was supported by most attitude researchers in social

psychology literature who believed that attitudes had behavioral consequences (Judge et al., 2001). They argued that attitudes, i.e., attitudes to the job, led to behaviors, i.e., performance on the job.

Later, many researchers challenged the assumption that “the happy worker is the productive worker” (Locke, 1970, p. 484) and began questioning both the strength and the direction of the high satisfaction leading to high performance relationship. They reversed the hypothesized causality and suggested that performance led to satisfaction (Judge et al., 2001). They argued that people who were better able to do their jobs and performed well had higher job satisfaction (Spector, 1997). Contrary to satisfaction leading to productivity approach, this reversed direction of the relationship was based on the assumption that attitudes followed behavior (Judge et al., 2001).

The theoretical rationale for performance leading to satisfaction relationship was grounded in expectancy-based and self-determination theories of motivation in social psychology literature (Deci & Ryan, 1985; Gagner & Deci, 2005; Judge et al., 2001; Lawler & Porter, 1967; Locke, 1970; Vroom, 1964). Broadly speaking, these theories suggested that performance led to valued outcomes that were satisfying to individuals (Judge et al., 2001). For example, building on Vroom’s expectancy theory of motivation, Lawler and Porter (1967) proposed a model in which successful performance of a task led to satisfaction. According to Lawler and Porter’s model, performance was related to satisfaction, and this relationship was moderated by the rewards for performance and the perceived equity of these rewards. Lawler and Porter (1967) stated that “good performance may lead to rewards, which in turn lead to satisfaction” (p. 23). According to the model, job performance led to satisfaction if the employees believed that they would be fairly rewarded for their jobs.

Locke (1970) also suggested that satisfaction was primarily a result of performance. He hypothesized that performance was satisfying to the extent that it led to important work values. If job satisfaction was achieved from the fulfillment of one’s needs, Locke argued that by performing at a higher level, individuals could better fulfill their needs, and thus, would become more satisfied.

Deci and Ryan's (1984) self-determination theory also argued that satisfaction followed from the rewards that resulted from behavior. Further, self-determination theorists believed that when people performed effectively on the job, they experienced satisfaction of the basic psychological needs and had positive attitudes towards their jobs (Gagner & Deci, 2005). However, they suggested that if individuals were controlled in their motivation, for example, when they were "prompted by external or introjected contingencies," effective performance was less likely to result in high levels of job satisfaction (Gagner & Deci, 2005, p. 353).

Despite the significant interest in productivity leading to satisfaction relationship in organizational psychology, there have been fewer studies in higher education literature that investigated this direction of the relationship. Traditionally, higher education researchers have favored attitude leading to behavior approach and have typically examined to what extent faculty members' attitudes affected their behavior, such as productivity or performance (Johnsrud, 2002). For example, one of the earliest studies that looked at the relationship between job satisfaction and publication rates was conducted by McNeece (1981). The study examined scholarly productivity, tenure and job satisfaction of graduate social work faculty. Based on the analysis of data from the sample of 97 social work educators, using Pearson product-moment correlations, McNeece (1981) found little effect of job satisfaction on publication rates. Blackburn and Lawrence (1995) in their model of faculty productivity also examined the effect of satisfaction and morale on faculty productivity. In their model, job satisfaction and morale were included in the construct of *self-knowledge*, together with personal interest, commitment, efficacy, and psychological characteristics. The model of faculty productivity proposed by Bland, Center, Finstad, Risbey, and Staples (2005) is also noteworthy here. They suggested that the interaction between the motivation at the individual level and equitable rewards for research performance offered by the institution together with other institutional characteristics resulted in more productive faculty.

All these studies (Blackburn & Lawrence, 1995; Bland et al., 2005; McNeece, 1981) assumed an attitude (i.e., job satisfaction) leading to behavior (i.e., productivity) approach in their analyses of faculty productivity and satisfaction. There have been only a couple of other

studies that were implicitly grounded in the assumption that attitudes followed behavior (e.g., Jacobs & Winslow, 2004; Terpstra, Olson, & Lockeman, 1982). For example, the study by Terpstra, Olson, and Lockeman (1982) from Organizational Studies literature examined how faculty work attitudes and their job performance were affected by MBO, or management by objectives, which is an approach to management that aims at increasing performance by aligning organizational goals with employee objectives. The data were gathered from survey responses of 23 faculty members in the College of Business and Economics, interviews with department heads, and archival resources. The researchers concluded that performance increased as a result of the MBO, while satisfaction declined, indirectly suggesting that increased productivity resulted in depressed satisfaction.

A more recent study by Jacobs and Winslow (2004) is also noteworthy because it discussed the effects of time pressures and length of the workweek on faculty satisfaction/dissatisfaction with their workload. The researchers examined two competing views regarding the nature of academic work. The first, optimistic view of faculty work, which the researchers labeled as self-imposed view, suggested that academia was a context in which devotion to work was self-imposed. Faculty loved their work and they chose to devote more time to it. On the contrary, pessimistic or the structural constraints view held that faculty work patterns were the result of professional and institutional pressures. The findings from this study revealed that faculty dissatisfaction with workload increased with hours on the job, which suggested that the workload was not self-imposed and willingly chosen, but was driven by increasing institutional and professional demands (Jacobs & Winslow, 2004).

From the review of the literature on faculty productivity-satisfaction relationship, it was evident that a more thorough analysis was needed to understand the effects of faculty productivity in the areas of research, teaching, and service on their job satisfaction. With recent calls for greater faculty accountability and more scrutiny of their work, it is beneficial to understand whether highly productive faculty are also highly satisfied with their jobs. As suggested by the expectancy-based and self-determination theories of motivation, when good performance is not rewarded and does not lead to need fulfillment, or if it is controlled or prompted by external forces, it may not lead to job satisfaction (Deci

& Ryan, 1984; Gagner & Deci, 2005; Lawler & Porter, 1967; Locke, 1970; Vroom, 1964). A more thorough analysis of faculty productivity and satisfaction relationship as conducted in this study might shed some light on important aspects of faculty work in today's changing academic workplace.

Conceptual Model

Much of the previous research examining the structure of faculty work demonstrates that faculty work is complex with conflicting and competing roles and responsibilities (Bellas & Toutkoushian, 1999; Blackburn & Lawrence, 1995; Boyer, 1990; Fairweather, 2002, 2005; Fairweather & Beach, 2002; Gappa et al., 2007; Houston, et al., 2006; Porter & Umbach, 2001; Schuster & Finkelstein, 2006). Studies on faculty productivity have tried to understand the relationship among various functions of faculty work, such as teaching, research, and service. Despite the strong belief in complementarity of these functions, most empirical evidence suggests that research, teaching, and service are different dimensions of faculty work that often compete for faculty members' time and commitment and are in conflict with one another (e.g., Fairweather, 1993, 1996, 2005; Fox, 1992; Hattie & Marsh, 1996; Linsky & Straus, 1975). The conflict among the roles of research, teaching, and service is reinforced by institutional and departmental reward structures, which emphasize "the discreteness, not the mutuality" (Fairweather, 1993, p. 44) of these activities.

Research has clearly become the central work activity for successful promotion and tenure at research universities (Blackburn & Lawrence, 1995; Fairweather, 1997). At the same time, there has been a renewed emphasis on teaching as a fundamental part of faculty work (Boyer, 1990). Despite the fact that teaching excellence brings little recognition beyond the campus, it still remains an important piece of an academic culture within institutions of higher education (Blackburn & Lawrence, 1995; Park, 1996). Another important facet to faculty work is service (Boyer, 1990; Blackburn & Lawrence, 1995; Fairweather, 1997). While service work often goes unrewarded or unrecognized and is even skeptically viewed by most faculty, it is an important aspect of faculty socialization within the academy and is viewed as a commitment to the institution and the profession.

In the time of rising pressures and demands placed on faculty work, it is important to examine how faculty productivity in the core academic areas of research, teaching, and service relates to their job satisfaction. As discussed in the previous section, both the strength and the direction of the relationship between productivity and job satisfaction have been continuously debated and challenged. In their comprehensive review of the literature, Judge et al. (2001) provide a number of different models of how this relationship could be specified. The oldest specification, grounded in the human relations movement, assumes a unidirectional linear relationship with job satisfaction affecting productivity. Other conceptualizations suggest either the reciprocal relationship between job satisfaction and productivity, or the relationship involving moderator variables, such as reward contingency, job complexity, self-esteem, etc. (Judge et al., 2001). Another common specification, grounded in expectancy and self-determination theories of motivation, suggests a unidirectional linear relationship, but this time with productivity leading to job satisfaction. As noted in the previous section, our study assumes the latter of these approaches to understand how faculty attitudes to the job (i.e., job satisfaction) might be affected by their performance or productivity on the job. Thus, the conceptual model was proposed to test for the direct effects of faculty productivity, in the core academic areas of research, teaching, and service, on their job satisfaction.

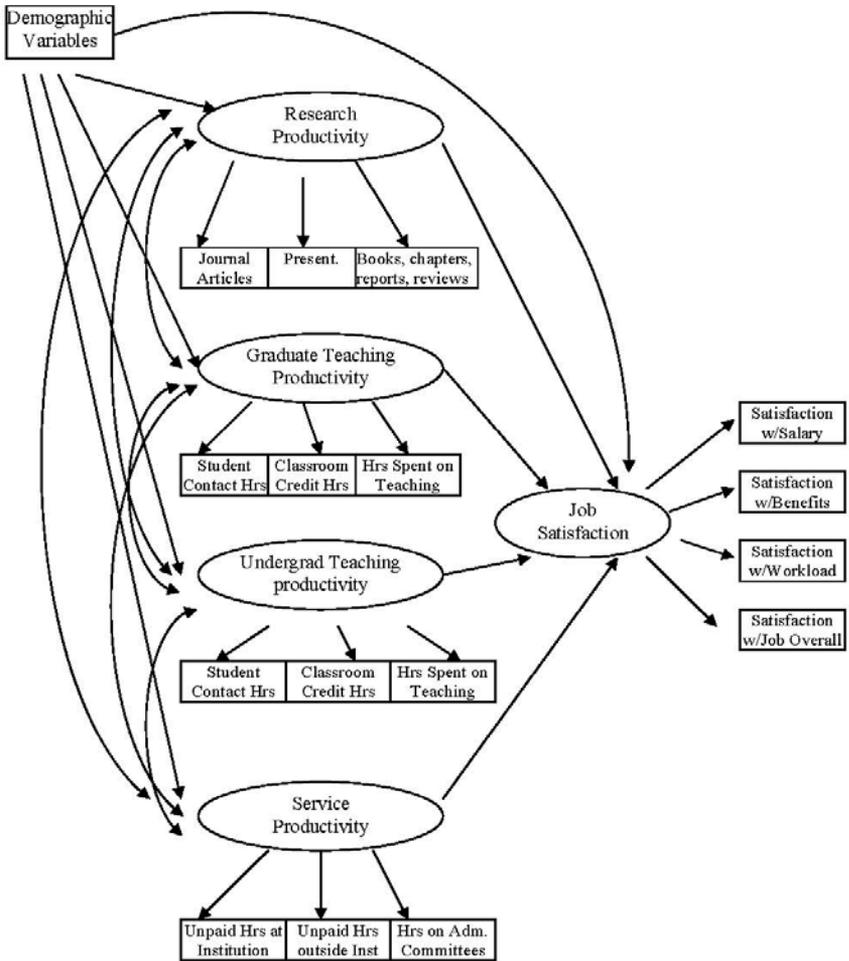


Figure 1. Proposed Conceptual Model

In addition, as illustrated in Figure 1, selected demographic variables (i.e., gender, race, academic rank, and tenure status) were also hypothesized to affect faculty members’ productivity and job satisfaction. These demographic variables were included in the model as control variables for two primary reasons. First, previous research

reveals that faculty job satisfaction varies by their rank, tenure status, gender, and race (e.g., Aguirre, 2000; Aguirre, Martinez, & Hernandez, 1993; Bower, 2002; Fraser & Hodge, 2000; Hagedorn, 1996; Johnsrud & Sadao, 1998; Olsen, Maple, & Stage, 1995; Rosser, 2004; Smart, 1990; Tack & Patitu, 1992). Gender and race/ethnicity have been the most researched variables, yet the evidence remains mixed with respect to their relationship with job satisfaction. However, several studies reveal that female and minority faculty members tend to be less satisfied than their colleagues (e.g., Aguirre, 2000; Hagedorn, 1996; Johnsrud & Sadao, 1998; Rosser, 2004; Tack & Patitu, 1992). In addition, past research shows that tenure and rank also influence overall job satisfaction and faculty attitudes toward teaching, research, recognition, compensation, and support (e.g., Hagedorn, 1996; Iacqua, Schumacher, & Li, 1995; Olsen, 1993; Rosser, 2004, 2005).

In addition, there has been a continued interest in studying variations in faculty productivity by gender, race/ethnicity, academic rank, and tenure. Productivity truly “operates as both cause *and* effect of status” in the academy (Fox, 2005, p. 131). It is linked with the status and reputation and is reflected in institutional reward structures (e.g., Allen, 1997; Aguirre, 2000; Bland et al., 2005; Fox, 2005; Park, 1996; Sax, Hagedorn, Arredondo, & Dicrisi, 2002; Tack & Patitu, 1992; Tien, 2007; Turner & Myers, 2000; Xie & Shauman, 1998). Thus, unless we understand variations in productivity across different demographic groups, we will be unable to assess and correct existing differences and inequities in the structure of faculty work and rewards (Fox, 2005).

Purpose and Research Questions

The purpose of the study was to conceptualize and measure faculty productivity and job satisfaction at research universities and examine how faculty productivity in the areas of teaching, research, and service related to their job satisfaction. Two research questions guided the investigation. The intent of the first research question was to conceptualize and measure faculty members’ job satisfaction and productivity in the areas of graduate and undergraduate teaching, research, and service at research universities, and examine the relationship among these constructs. The second research question intended to examine how productivity in the areas of graduate and undergraduate teaching, research, and service affected faculty job

satisfaction, while controlling for selected demographic characteristics (i.e., gender, race/ethnicity, academic rank, and tenure).

Research Design

Data Source and Sample

The study is a secondary data analysis, utilizing the 2004 National Study of Postsecondary Faculty (NSOPF:04) data set. NSOPF:04 provided a nationally representative sample of faculty and instructional staff at public and private degree-granting institutions in the U.S. (National Center for Education Statistics (NCES), 2006). NSOPF:04 relied on complex sampling, which included stratification, multiple stages of selection, and unequal probability selection of respondents (NCES, 2006). NSOPF:04 consisted of a sample of 35,630 faculty and instructional staff across a sample of 1,080 institutions. The data were collected using a Web-based questionnaire that was either self-administered or conducted via telephone with a trained interviewer (NCES, 2006). Completed surveys were obtained from about 26,100 faculty and instructional staff, for a weighted response rate of 76%.

The sample of this study included 3,920 faculty members from NSOPF:04 who were employed full-time at Research Extensive and Intensive universities and whose primary responsibility was teaching. Of this sample, 1,570 (40.0%) were females and 2,350 (60.0%) were males. Whites comprised 3,270 (83.4%) of the sample, while 270 (6.9%) were Asian/Pacific Islander, 180 (4.6%) were African-American, and 200 (5.1%) were Hispanic. Of faculty in our sample, 2,040 (52.4%) were tenured. Of the total sample, 960 (24.4%) were assistant professors, 1,020 (26.0%) were associate professors, and 1,170 (29.8%) held the rank of full professor.

Variables and Measures

The NSOPF:04 survey was designed to collect information regarding faculty backgrounds, workloads, responsibilities, salaries, benefits, attitudes, and future career plans from a nationally representative sample of faculty and instructional staff across the U.S. (NCES, 2006). NSOPF:04 is the most recent large-scale secondary data set of faculty available. We recognize that secondary data always restrict the researcher in the choice of measurement tools (e.g., Castle, 2003; Clarke

& Cossette, 2000; Coyer & Gallo, 2005; Hofferth, 2005; Thomas & Heck, 2001). However, despite these data limitations, we believe NSOPF:04 is the ideal data set to be used for the purposes of this study. What follows is the description of the variables from NSOPF:04 that were used as measures of productivity and job satisfaction in our study.

Productivity. The review of the literature indicates that productivity is most often measured in terms of outputs or outcomes faculty members produce with their work (e.g., Allen, 1997; Blackburn & Lawrence, 1995; Fairweather, 1997, 2002, 2005; Fox, 2005; Massy & Wilger, 1995; Meyer, 1998; Middaugh, 2001; Porter & Umbach, 2001; Presley & Engelbride, 1998; Townsend & Rosser, 2007). For example, common scholarly output measures include number of publications, conference presentations, grants, etc. Service work is often measured in terms of unpaid tasks faculty members perform at the institution or in their professional communities. There is less agreement on what constitutes teaching productivity. Some researchers argue that instructional output measures should account for the quality of students' learning, which is difficult to incorporate in faculty productivity studies. It can only be assumed that commonly used teaching productivity measures, such as the amount of time spent in the classroom, with the students, and on the instructional material preparation will ensure and serve as a proxy for quality of students' learning outcomes (Blackburn & Lawrence, 1995; Fairweather, 2002).

Consistent with this previous literature, we used the following variables from NSOPF:04 to measure scholarly, teaching, and service productivity. Scholarly productivity was measured as (1) the number of articles in refereed and non-refereed journals; (2) the number of books, reports, book reviews, and chapters; and (3) the number of presentations and performances or exhibitions. On each of these variables, faculty members reported number of scholarly outputs from the past two years.

Teaching productivity was measured separately at the graduate and undergraduate levels by the following three variables from NSOPF:04: (1) the number of classroom credit hours, (2) the number of student contact hours, and (3) the amount of time spent on teaching, at the graduate and undergraduate levels, respectively. The variables were created by adding together the number of credit hours, student contact

hours, or hours spent on teaching, respectively, in five or fewer classes for credit per week during the 2003 Fall term.

Service productivity was measured by the following three variables from NSOPF:04: (1) the number of hours spent on unpaid tasks at the institution, (2) the number of hours spent on unpaid tasks outside of the institution, and (3) the number of hours on administrative committees. On the first variable, faculty were asked to report the average number of hours per week spent on unpaid tasks at the institution (e.g., club assistance, recruiting, attending institution events, etc.) during the 2003 Fall term. On the second variable, respondents indicated the average number of hours per week on unpaid professional service activities outside the institution during the 2003 Fall Term. On the third variable, faculty were asked to report the number of hours per week they spent on administrative committee work, including curriculum, personnel, governance, and other committees at the department, division, institution, and system levels.

Job Satisfaction. Past research has provided numerous conceptual and operational definitions of job satisfaction. In the beginning, researchers studied job satisfaction from the perspective of need fulfillment, i.e., whether or not the job met the employee's physical and psychological needs (Spector, 1997). Later, this approach was replaced by attitudinal perspective, which focused more on cognitive processes rather than needs. Job satisfaction became viewed as an attitudinal psychological variable described "as a global feeling about the job or as a related constellation of attitudes about various aspects or facets of the job" (Spector, 1997, p. 2). This complexity gives way to the multiplicity of ways in which the construct of job satisfaction can be operationalized and measured (Gruneberg, 1979; Schultz, 1973).

Building on the previous research (e.g., Hagedorn, 2000; Olsen, 1993; Rosser, 2004, 2005; Smart, 1990) and based on the context for this study, the study utilized four variables from NSOPF:04 to measure the construct of faculty job satisfaction: satisfaction with (1) workload, (2) salary, (3) benefits, and (4) the job overall at the institution. On each of these variables, faculty members were asked to indicate the level of their satisfaction on a four-point ordinal scale with workload, salary, benefits, and the job overall at their employing institution during the 2003 Fall

term. The responses were coded as 1 = Very Dissatisfied, 2 = Somewhat Dissatisfied, 3 = Somewhat Satisfied, and 4 = Very Satisfied.

Demographics. Based on the review of the literature on faculty productivity (e.g., Allen, 1997; Aguirre, 2000; Bland et al., 2005; Fox, 2005; Sax, et al., 2002; Tack & Patitu, 1992; Tien, 2007; Turner & Myers, 2000; Xie & Shauman, 1998), we included four demographic variables as control variables in our final SEM analysis: (1) gender, (2) race/ethnicity, (3) academic rank, and (4) tenure status. The variable of *gender* included two groups: female and male faculty members. The variable of *tenure status* was categorized into two groups as well: tenured and untenured faculty members, with the latter including both individuals who were not on tenure track and who were on tenure track but not yet tenured. The variable of *academic rank* was represented by three categories: assistant professors, associate professors, and full professors. Full professors were used as a reference category in the SEM analysis. The variable of race/ethnicity included four categories: (a) Asian/Pacific Islander; (b) Black, Non-Hispanic; (c) Hispanic White or Hispanic Black; and (d) White non-Hispanic (reference group). All demographic variables were dummy coded (e.g., 1 = Female and 0 = Male) as needed for the final analysis.

Data Analysis

We utilized structural equation modeling (SEM) to answer the research questions in the study. *Mplus* Version 5 statistical package was employed to conduct SEM (Muthén & Muthén, 2007). There are several reasons for choosing SEM for the analysis in this study. First, the constructs of teaching, research, and service productivity and job satisfaction are complex and there is a clear need for a statistical technique that permits us to use multiple observed variables to define and measure these constructs. Second, SEM assures greater validity and reliability of observed variables by taking the measurement error into account when analyzing data (Schumacker & Lomax, 2004). Finally, SEM provides an ability to simultaneously define and measure multidimensional constructs of teaching, research, and service productivity and job satisfaction and to test for the direct effects of productivity on job satisfaction across the faculty at research universities, while controlling for selected demographic characteristics.

As the preliminary step in the analysis, we analyzed the data descriptively. The data were also checked for nonlinearity, nonnormality, missing data, and outliers. Next we proceeded with SEM analysis in two stages. First, we validated the measurement model through Confirmatory Factor Analysis (CFA). Second, we continued with testing the hypothesized structural model (SEM) to determine the impact of faculty productivity on job satisfaction, while controlling for selected demographic characteristics (i.e., gender, race/ethnicity, academic rank, and tenure).

Limitations

Like all secondary data analyses, the study has some limitations related to sampling and measurement. First, secondary data restricted our choice of productivity and satisfaction measures from NSOPF:04 data set. One of the limitations of this study was the use of quantitative measures of productivity that do not directly equate with the quality of products or outcomes of faculty work. We had to use the best available proxies from the original data set. For example, potentially important productivity variables that could have served as the measures of quality of research, teaching, and service outputs produced by the faculty member were not included in the study. It could only be assumed that peer review process for publications and the amount of time spent in the classroom and with the students would ensure and serve as a proxy for quality (Blackburn & Lawrence, 1995; Fairweather, 2002).

Second, as Clarke and Cossette (2000) note, common methodological limitation of secondary data analysis is related to sampling, including sampling biases, sample representativeness, and issues related to the selection of subgroups from a large primary data set. We utilized the following corrective strategies to address some of these shortcomings and to make the data representative of the population. First, to correct for oversampling, raw faculty weights provided by NCES were transformed into relative weights by dividing the raw weight by its mean. Second, to correct for the effect of clustering, we further adjusted the relative weight by the design effect (Thomas & Heck, 2001). These corrective strategies were important not only to make the data representative of the population but also “to compensate for underestimation of standard errors” due to intracluster correlations (Thomas & Heck, 2001, p. 529) that could potentially lead to an increased likelihood of committing Type I errors.

Results

Step 1 – CFA Model

The first step in our analysis was to validate the constructs of productivity and job satisfaction through Confirmatory Factor Analysis. For this model, the chi-square coefficient was 895.210 with 90 degrees of freedom and significant ($p = .000$). Because of the chi-square's sample size dependency, other fit indices were examined to supplement the significant chi-square test statistic and to evaluate the overall model fit (Hu & Bentler, 1995; Schumacker & Lomax, 2004). All the fit indices suggested that the proposed model fit the data well. For example, the RMSEA and SRMR values were .048 and .034, respectively. CFI value was .974 and TLI value was .962, both suggesting a good fit of the CFA model to the observed data.

Significant path loadings in Table 1 illustrate that all of the observed variables were statistically good indicators of the constructs of productivity and job satisfaction in the CFA model. More specifically, parameter estimates relating the observed variables to the job satisfaction construct (i.e., satisfaction with workload, satisfaction with salary, satisfaction with benefits, and satisfaction with the job overall) were .64, .71, .60, and .76, respectively, and they were all significant. The research productivity construct consisted of number of articles published (.70); books, book reviews, chapters, and reports (.51); and presentations/performances (.61). Parameter estimates relating the observed variables to the construct of service productivity (i.e., number of hours on unpaid tasks within and outside of institution and hours on administrative committee work) were .39, .51, and .32, respectively. Parameter estimates relating the observed variables (i.e., undergraduate classroom credit hours, hours per week of undergraduate teaching, and undergraduate student contact hours) to the construct of undergraduate teaching productivity were .90, .74, and .83, and they were all significant. Similarly, graduate classroom credit hours (.89), hours per week spent on teaching at the graduate level (.67), and graduate student contact hours (.94) were also statistically significant indicators of graduate teaching productivity.

Table 1
CFA Model: Factor Loadings

Factors and Variables	Factor Loadings
<i>Research Productivity</i>	
Refereed and non-refereed articles	.70
Books, book reviews, reports, chapters	.51
Presentations, exhibitions/performances	.61
<i>Graduate Teaching Productivity</i>	
Classroom credit hours per week	.89
Hours spent on teaching per week	.67
Student contact hours per week	.94
<i>Undergraduate Teaching Productivity</i>	
Classroom credit hours	.90
Hours spent on teaching per week	.74
Student contact hours	.83
<i>Service Productivity</i>	
Hours on unpaid tasks at the institution	.39
Hours on unpaid tasks outside of institution	.51
Hours on administrative committee work	.32
<i>Job Satisfaction</i>	
Satisfaction with workload	.64
Satisfaction with salary	.71
Satisfaction with benefits	.60
Satisfaction with the job overall	.76

Note. All parameter estimates were significant * $p < .05$

We also examined factor relationships in the CFA model. As the factor correlation coefficients illustrate in Table 2, the correlations between the constructs of job satisfaction and service productivity, and job satisfaction and undergraduate teaching productivity were negative and significant (-.19 and -.09, respectively). The correlations between job satisfaction and research, and job satisfaction and graduate teaching productivity were non-significant (-.08 and .01, respectively). In addition, research productivity was significantly and positively related to service (.53) and graduate teaching (.30), but significantly and negatively related to undergraduate teaching productivity (-.32). Service productivity was positively and significantly related to graduate teaching (.17), but significantly and negatively related to undergraduate teaching (-.11). Finally, the constructs of graduate and undergraduate teaching

productivity were significantly and negatively related with each other (-.70).

Table 2
CFA Model: Factor Correlations

Constructs	Research Productivity	Graduate Teaching Productivity	Undergrad Teaching Productivity	Service Productivity	Job Satisfaction
Research Productivity	-				
Grad Teaching Productivity	.30*	-			
Undergrad Teaching Productivity	-.32*	-.70*	-		
Service Productivity	-.53*	.17*	-.11*	-	
Job satisfaction	-.08	.01	-.09*	-.19*	-

Note. * $p < .05$

Step 2 – SEM Model

SEM analysis provided the possibility to simultaneously measure and define productivity and job satisfaction constructs and to test for the direct effects of productivity on job satisfaction, while controlling for selected demographic variables. The validity of the final SEM model was assessed by commonly used goodness-of-fit measures (CFI=.963, TLI=.947, SRMR=.039, and RMSEA = .036) that indicated a strong fit of the model (Hu & Bentler, 1995; Schumacker & Lomax, 2004).

In the final SEM model, all factor loadings relating the observed variables to their latent factors of productivity and satisfaction remained very similar to the factor loadings reported in the CFA model. After the validity of the constructs was confirmed, we examined the effects of productivity on job satisfaction. As illustrated in Table 3, the parameter estimates leading service and undergraduate teaching productivity to job

satisfaction were negative and significant (-.22 and -.14, respectively). The effects of research and graduate teaching productivity on job satisfaction were non-significant (-.01 and -.03).

Table 3
Final SEM Model: The Effects of Productivity and Demographics on Job Satisfaction

	Parameter Estimates
<i>Job Satisfaction</i>	
Research Productivity	-.01
Graduate teaching productivity	-.03
Undergraduate teaching productivity	-.14*
Service productivity	-.22*
Female	-.05*
Black	-.01
Asian	-.07*
Hispanic	-.04
Associate professor	-.12*
Assistant professor	-.08*
Tenured	.01

Note. * $p < .05$

In addition, as illustrated in Table 4, parameter estimates leading undergraduate teaching productivity to research was negative and significant (-.19). On the other hand, parameter estimates leading service to research productivity was positive and significant (.48). The effect of undergraduate teaching on graduate teaching productivity was negative and significant (-.56). Finally, the effect of service on undergraduate teaching was also negative and significant (-.13).

Table 4
Final SEM Model: Parameter Estimates

	Parameter Estimates
<i>Research Productivity</i>	
Graduate teaching productivity	.05
Undergraduate teaching productivity	-.19*
Service productivity	.48*
Female	-.14*
Black	-.014
Asian	.05*
Hispanic	.01
Associate professor	-.08*
Assistant professor	.15*
Tenured	.19*
<i>Graduate Teaching Productivity</i>	
Undergraduate teaching productivity	-.56*
Service productivity	.04
Female	.01
Black	-.01
Asian	-.01
Hispanic	.01
Associate professor	.02
Assistant professor	-.01
Tenured	-.01
<i>Undergraduate Teaching Productivity</i>	
Service productivity	-.13*
Female	.05*
Black	.01
Asian	-.04*
Hispanic	-.01
Associate professor	.01

Table 4 cont.

	Parameter Estimates
Assistant professor	-.14*
Tenured	-.19*
<i>Service Productivity</i>	
Female	.10*
Black	.08*
Asian	-.01
Hispanic	-.01
Associate professor	.06
Assistant professor	.12*
Tenured	.42*

Note. * $p < .05$

When controlling for demographic variables, SEM model revealed some important findings. For example, female faculty members were significantly more productive in undergraduate teaching (.05) and service (.10), but significantly less productive in research (-.14) and at the same time significantly less satisfied (-.05). Assistant professors were significantly more productive in research (.15) and service (.12), but significantly less productive in undergraduate teaching (-.14) and less satisfied with their jobs (-.08) than their colleagues. Similarly, tenured faculty members were significantly more productive in research (.19) and service (.42) but significantly less productive in undergraduate teaching (-.19). In addition, the results showed that Asian faculty were significantly less satisfied than their white faculty counterparts (-.07). Associate professors were also significantly less satisfied than their colleagues at the full professor rank (-.12). The effects of all selected demographic variables on productivity and job satisfaction are presented in Tables 3 and 4.

Discussion

The intent of the first research question was to conceptualize and measure faculty members’ job satisfaction and productivity in the areas of graduate and undergraduate teaching, research, and service, and examine the relationship among these constructs. The validity of the constructs was supported for the faculty sample in this study. More specifically, the model confirmed that three dimensions of scholarship

(i.e., number of articles; books, book reviews, chapters, and reports; and presentations), three dimensions of graduate and undergraduate teaching (i.e., classroom credit hours, hours per week teaching credit classes, and student contact hours), three dimensions of service (i.e., number of articles; number of books, book chapters, reviews, and reports; and number of presentations), and four dimensions of job satisfaction of (i.e., satisfaction with workload, satisfaction with salary, satisfaction with benefits, and satisfaction with the job overall) were useful in understanding faculty members' productivity and satisfaction at research universities.

The examination of the intercorrelations among productivity constructs provided some important observations about faculty work. Consistent with the previous research, the findings of this study suggest that core areas of academic work are not always mutually reinforcing and are competing for faculty members' time and effort (Bellas & Toutkoushian, 1999; Fairweather, 1993; 2005; Fox, 1992; Hattie & Marsh, 1996; Linsky & Straus, 1975). As previously discussed, there has been extensive research in higher education literature that tried to understand the relationship among various functions of faculty work (Colbeck, 1998; Fox, 1992; Hattie & Marsh, 1996; Linsky & Straus, 1975). Some researchers believed that various faculty roles were complimentary and involvement in one contributed to the other (Colbeck, 1998; Fox, 1992; Hattie & Marsh, 1996; Linsky & Straus, 1975). Others suggested that faculty work consisted of segmented and conflicting roles and responsibilities that were competing for faculty members' time and commitment (Fairweather, 1993, 2005; Fairweather & Beach, 2002; Fox, 1992; Hattie & Marsh, 1996; Houston, et al., 2006; Linsky & Straus, 1975). The evidence from this study supports both mutuality and competition arguments.

The study indicates that there are some areas of academic work that complement each other, as a theory of integrated roles would suggest, and some that compete for faculty members' time and commitment, as the theory of segmentation would suggest (Fox, 1992). Namely, for the faculty members in this study, there was a better alignment among their research, service, and graduate teaching roles. On the other hand, undergraduate instruction was somewhat "at odds" (Fox, 1992, p. 303) with all the other faculty tasks, especially with research.

These findings should not be very surprising. As would be expected, faculty who work with graduate students might more likely integrate their teaching and research interests that may lead to increased productivity in both research and graduate instruction. Furthermore, research productive faculty could also be aligning their service responsibilities with their research interests better or could be spending more time on service outside the institution that gives them more recognition and collaborative opportunities with their professional colleagues.

The study also showed that the distribution of faculty members' work activities and job satisfaction varied by their demographic characteristics. The disparity among the core academic functions of teaching, research, and service was the most evident when examined by gender. Female faculty members were more likely than their male counterparts to be more involved in undergraduate teaching and service and consequently, less engaged in research. This finding is consistent with much of the previous literature on female faculty productivity (e.g., Allen, 1997; Bellas & Toutkoushian, 1999; Fox, 2005; Park, 1996; Sax et al., 2002; Toutkoushian & Conley, 2005; Xie & Shauman, 1998). At the same time, females were significantly less satisfied with their jobs than their male counterparts, which also seems consistent with the literature (e.g., Aguirre, 2000; Hagedorn, 1996; Rosser, 2004; Tack & Patitu, 1992). When controlling for race/ethnicity, the researchers found that race contributed very little to the variance in faculty productivity and job satisfaction. The only significant findings were that Asian faculty members were less productive in undergraduate teaching, but more productive in research. They were also significantly less satisfied with their jobs than their white colleagues. We suspect that disproportional representation of the sample across racial categories might have led to less variance in productivity and satisfaction by race/ethnicity in the study (Whites comprised 83.4% of the sample as compared with 6.9% Asians, 4.6% African-Americans, and 5.1% Hispanics).

With regard to the academic rank, assistant professors in this study were significantly more productive in research and service. For one, this finding indicates that increased pressures and expectations to publish are more evident for early-career faculty members. For another, this finding suggests that faculty members during their pre-tenure period might be aligning their work activities and shifting their focus more towards

research and service to make certain that they achieve high levels of productivity in research and develop professional networks. It should also be noted that despite their high productivity, assistant professors were significantly less satisfied with their jobs than their colleagues at the full professor rank.

The purpose of the second research question was to examine how productivity in the areas of teaching, research, and service affected faculty job satisfaction in the study. The findings revealed that faculty who were more productive in undergraduate teaching and service had significantly lower job satisfaction. One likely explanation for these inverse relationships could be that measures of teaching and service productivity and time spent on these activities may not be valued as much and may not be tied to rewards, such as pay and promotion (Fairweather, 1993, 1997, 2005). Expectancy and self-determination theories of motivation suggest that good performance is satisfying if it leads to valued outcomes and greater intrinsic and extrinsic rewards (Deci & Ryan, 1984; Gagner & Deci, 2005; Lawler & Porter, 1967; Locke, 1970; Vroom, 1964). These theories argue that people are motivated to perform better and produce more if they feel that better outcomes of their work will lead to increased rewards and recognition.

Most of the previous research on faculty productivity shows that faculty who publish more and work with graduate students, especially at research universities, are more likely to receive higher salaries, earn tenure, be promoted to higher ranks, and be recognized for their work than their colleagues who devote more time to undergraduate teaching and service (e.g., Fairweather, 1997, 2005). Fairweather (2005) argues that spending more hours on undergraduate instruction is related to a lower base salary regardless of the type of institution. In addition to pay, the value system of the academic culture is also communicated in tenure and promotion decisions and annual reviews. The fact that among various functions of academic work, undergraduate teaching and service are particularly undervalued could partly explain the negative relationship the study found between these roles and faculty job satisfaction.

Another likely explanation of these negative relationships could be the assumption suggested by self-determination theorists that when motivation to perform better is “prompted by external” contingencies,

effective performance was less likely to result in high levels of job satisfaction (Gagner & Deci, 2005, p. 353). Traditionally, faculty members at research universities report a greater orientation to research than teaching (Schuster & Finkelstein, 2006). The actual and “preferred” distribution of faculty time suggests that faculty at research universities would like to engage in more research activities and shift some of their time from teaching to research (Finkelstein, Seal, & Schuster, 1998; Schuster & Finkelstein, 2006). At the same time, there are growing external pressures on faculty to pay more attention to teaching and undergraduate education. Despite some faculty members’ preferred orientations to research, they might have to respond to these growing external pressures and workload expectations and engage in more undergraduate teaching and service. When outside pressures and expectations divert faculty from their most valued activities, they might experience “considerable strain that might negatively affect their work” (Schuster & Finkelstein, 2006, p. 87). The researchers suggest that because increased undergraduate teaching and service productivity might be prompted by external pressures and contingencies, it might less likely lead to positive emotional responses to the job (Gagner & Deci, 2005).

One can argue that increased productivity, especially in undergraduate teaching and service, is not “willingly chosen” or “self-imposed” by faculty, but “is largely driven by institutional and professional demands” (Jacobs & Winslow, 2004, p. 11). As noted earlier, Jacobs and Winslow (2004) in their study outline two competing views regarding the nature of academic work. An optimistic or self imposed view of faculty work suggests that academia is a context in which devotion to work is self-imposed. Faculty members love what they do and they choose to devote more time and effort to it. In contrast, the pessimistic or structural constraints view holds that faculty work patterns are the result of institutional and professional pressures. This study seems to support Jacobs and Winslow’s pessimistic or structural constraints view of faculty work, which would suggest that increased teaching and service productivity may not be completely voluntary, but the result of growing demands and pressures from inside and outside of the academy.

Implications for Policy and Research

The study has important implications for the advancement of theory regarding productivity-satisfaction relationship. Despite the significant

interest in the linkage between job satisfaction and job performance/productivity in social and organizational psychology literature, not many higher education researchers have examined this relationship. This study partially addressed this gap in the literature, but there are other specific topics within the general framework that are worthy of further investigation. One of the limitations of this study was that rewards were not included in the analysis to moderate the relationship between faculty productivity and job satisfaction. This is clearly the area that further inquiries should address.

Past research has provided strong indications that good performance is satisfying because it leads to valued rewards (Judge et al., 2001). It would be worthwhile to examine in the future how different rewards, both intrinsic and extrinsic, would moderate the relationship between faculty productivity and job satisfaction. Including different measures of rewards as moderator variables in the model would provide a better understanding of the relationship between faculty productivity and satisfaction. It is critical that we understand better what is influencing the negative relationship between faculty productivity and job satisfaction. Using rewards as moderator variables holds some promise of providing some insight on this issue.

The findings regarding faculty productivity and satisfaction relationship also have important policy implications. Much is still unknown regarding the relationship between productivity and job satisfaction, but clearly, from the policy perspective, this relationship can tell us a lot about the effectiveness of the organization. Lawler and Porter (1967) argue that “a measure of the relationship between satisfaction and performance would be a helpful diagnostic tool for examining organizations” (p. 28). Research overwhelmingly supports the assumption that it is beneficial for the organization to keep highly productive employees satisfied with their jobs, because increased job satisfaction will encourage further good performance and will reduce turnover and absenteeism among productive faculty (Gruneberg, 1979; Herzberg et al., 1959; Schultz, 1973; Spector, 1997).

The study provides some evidence that faculty members’ hard work, especially in undergraduate teaching and service, does not lead to job satisfaction. These findings may suggest that good performance of faculty may not be fairly rewarded, may not be self-imposed, and in turn,

may not lead to job satisfaction. These findings are indicative that not all elements in the triad of faculty work might carry the same value and weight. Despite the fact that research is central for recognition and for successful promotion and tenure at research universities (Blackburn & Lawrence, 1995; Fairweather, 1997), teaching and service are also fundamental aspects of faculty work that should be no less rewarded, recognized, or supported. Teaching and service demonstrate faculty members' commitment to students, the institution, and the profession, and higher education institutions will be well served if they try to advance and give greater weight to these work efforts in rewards, pay, or promotion. Higher education institutions clearly need to rethink their reward structures, value systems, and expectations placed on faculty work in order to keep highly productive faculty more satisfied with their jobs, and thus provide them with the academic workplace that is more appealing and attractive.

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