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Healthcare is the largest industry in the United States and 60 percent of its 14 million workers are in allied health jobs. The need to attract and retain allied health faculty is critical to preparing a competent workforce in healthcare. This study reports the results of a survey of 259 faculty members working in diagnostic radiologic technology, nuclear medicine technology, and radiation therapy allied health programs in hospital, community college, proprietary schools, colleges, and universities in the United States and Puerto Rico. The analysis tested the value of seven intrinsic variables, six extrinsic variables, and eight personal and job characteristics for predicting the overall job satisfaction based on a survey created by Smerek and Peterson (2007). The analysis also tested Herzberg, Mausner, and Snyderman's (1959) well-known, duality theory of motivators and hygiene factors. The results suggested that Herzberg's theory may not be of value as a measure of job satisfaction in this population due to a strong correlation between extrinsic (hygiene) factors and overall job satisfaction, which according to Herzberg et al.'s (1959) theory should have little to neutral correlation. In addition, the results of this study revealed that the intrinsic variables of responsibility ($p = .001$), clarity of mission ($p = .042$), and the work itself ($p = .001$); and the extrinsic variables of effective supervision ($p = .000$), good relationships with co-workers ($p = .003$), and satisfaction with benefits ($p = .001$); as well as the personal characteristic of age ($p =$

.020) are significant predictors of overall job satisfaction. In addition, the job characteristic variable of number of employees was also significant ($p = .039$).

THE PREDICTIVE VALUE OF SELECTED EXTRINSIC AND INTRINSIC
INDICATORS OF OVERALL JOB SATISFACTION IN DIAGNOSTIC
RADIOLOGICAL TECHNOLOGY, RADIATION THERAPY,
AND NUCLEAR MEDICINE TECHNOLOGY
ALLIED HEALTH FACULTY

by

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Approved by

Committee Chair

To my wife, April,

Your love, support, and tolerance have turned my dreams into possibilities.

APPROVAL PAGE

This dissertation has been approved by the following committee of the
Faculty of The Graduate School at The University of North Carolina at Greensboro.

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CHAPTER I

INTRODUCTION

The Research Problem

Modern healthcare in the United States has evolved into a highly technical blend of professionals working in their own specialties toward the shared goal of healing patients and preventing disease. Healthcare is the largest industry in the United States with an estimated 14 million workers (United States Bureau of Labor and Statistics, 2009). Allied health professionals account for 60 percent of the entire health care workforce with workers involved in more than 200 distinct fields of practice. The Bureau estimates that healthcare will generate three million new jobs between 2006 and 2016, far more than any other industry. Change in healthcare will continue at an accelerated pace and with these changes will come a need for more training and higher-level training. Advances in technology have heightened access, accelerated distribution, increased innovation, and improved collaboration.

With these advances in technology come attendant challenges in keeping pace with educational needs, depersonalization, and the fear of an unknown future (Benson & Dundis, 2003). Preparing the future healthcare workforce requires allied health educators who are motivated and capable of instilling only the best possible practices in their students. These educators may not achieve the high level of training necessary for producing quality graduates if they are dissatisfied with their jobs. Therefore, identifying

conditions in the work setting that contribute to job dissatisfaction is imperative and calls for a collaborative effort by administrators, researchers, and health care planners (Sowell & Alexander, 1989). Both job satisfiers and causes of dissatisfaction must be identified so that strategies can be developed to counteract the problems of recruitment, retention, motivation, and overall job satisfaction (Herzberg, 1982; Rozier, Gildeson, & Hamilton, 1991).

Allied health educational programs exist in a broad range of institutions including universities, colleges, community colleges, hospitals, and for-profit businesses; offer a wide range of degrees from certificates to masters; and operate with educators from a variety of different backgrounds and varying degrees of education. Allied health is difficult to define due to its broad coverage of professions. The Pew Advisory Panel on Allied Health (1992) defined allied health as the professions including all of the health related disciplines with the exception of nursing and the so-called MODVOPP disciplines – medicine, osteopathy, dentistry, veterinary medicine, optometry, pharmacy, and podiatry. The scope of this research includes allied health faculty practicing in diagnostic radiologic technology, nuclear medicine technology, and radiation therapy. I selected these specific allied health professions due to the high dependence on the program director for the overall quality of the program, for the capabilities of the program's graduates and in many cases for the program's very existence (Adkins, 2008). Hospital administrators who do not appreciate education as being part of the mission of their institutions may view these programs as money-losers regardless of the quality of the program (Adkins, 2008).

Employee satisfaction, retention, and motivation continue to be important issues both for people who work in an organization and for the people who study the relationship between job satisfaction and organizational goals (Syptak, Marshall, & Wilmer, 1991). Job satisfaction and motivation are key organizational elements that ensure quality work, promote personal growth, maintain physical and psychological health, and decrease attrition (Hendrix, 1989; Mann & Jefferson, 1988). A universal definition of job satisfaction does not exist in the literature, but Hoppock and Locke proposed the definitions most commonly referred to in the literature. Hoppock (1935) described job satisfaction in the terms of any combination of physical, psychological, and environmental factors that cause a person to truthfully say, "I am satisfied with my job" (p.47). Locke (1969) described overall job satisfaction as a positive emotional state resulting from the appraisal of one's job as achieving or facilitating the achievement of one's values. Locke described job dissatisfaction as a negative emotional state resulting from the appraisal of one's work as blocking the attainment of one's values. Motivation is another definition with little universal agreement. Mitchell (1982) proposed a generic and understandable definition of motivation. Mitchell (1982) described motivation as a psychological process that gave direction and purpose to one's personal and professional behavior.

Job satisfaction has been one of the more hotly debated topics in organizational management over the past 50 years. Organizational psychologists, management specialists, human resource administrators, and many other groups have struggled with defining the real factors that contribute to workers' satisfaction and dissatisfaction.

Extensive research on this topic in a number of fields and in countries throughout the world has failed to produce universally agreed upon indicators. Major controversies still exist to this day (Brown & Sargeant, 2007). Herzberg, Mausner, and Snyderman (1959) suggested that people are motivated by intrinsic factors such as achievement, recognition, responsibility, and the work itself; whereas Seybolt (1976) and Smerek and Peterson (2007) attribute job satisfaction to extrinsic factors such as salary, corporate policy, administrative practices, and supervisory practices. The research on job satisfaction is complicated even more when applied to allied health educators, primarily because they persist in multiple levels of academia subjecting them to multiple forms of organizational structure.

Need for the Study

The United States Department of Labor and Statistics (2009) projected a 14.7 percent increase in the demand for nuclear medicine technologists from 2006 to 2016 while at the same time only predicting an 11.9 percent growth in the number of nuclear medicine technology educational programs. A projection for the demand of radiological technologists for the same period is 15.1 percent, with a predicted growth in the number of programs providing education estimated at only 11.9 percent. The projection for the demand of radiation therapists is an even more staggering 24.8 percent, with a projected growth in programs providing education estimated at only 12.0 percent. The American Society of Radiological Technologists (ASRT) reported a labor shortage of 18.0 percent nationwide in 2002. The normal response to this labor shortage is an increase in Radiological Technology Programs, but the opposite has occurred. From 1994 to 2001,

the number of programs accredited by the Joint Review Committee on Educational Programs in Radiological Technology (JRCERT) dwindled from 692 to 593, a loss of 14.3 percent. Further complicating the need for allied health educational programs and qualified allied health educators is the fact that the current professoriate in allied health is quickly approaching retirement age.

A typical response to job vacancies in other fields, specifically non-healthcare, would be to increase the number of students in each program. This is not a viable solution for these radiology programs because the number of available clinical opportunities limits the ability for expansion. For example, a large university nuclear medicine program may only have the capacity to accept 10 to 12 students because they only have 10 to 12 nuclear medicine gamma cameras, the machines used to acquire the patient images. The Joint Review Committee for Educational Program in Nuclear Medicine Technology (JRCNMT) requires that students, technologists, and scanners have a one to one ratio to avoid redundancy, which would reduce the clinical opportunities available to each student. Therefore, in order to meet increased demand it is necessary for new programs to open or for existing programs to find additional clinical opportunities in hospitals and clinics outside of their current areas. The latter response may be difficult due to hospital affiliations, long distances between hospitals, and liability insurance for the students when they go into hospitals not owned or operated by the sponsoring institution.

The field of higher education has benefited from substantive research on the experience of faculty members at two and four-year institutions. The research is predominantly survey-based and attempts to label single variables of job satisfaction or

happiness with work as the answer for academic administrators. For example, several recently published studies have explored the effects of salary on job satisfaction and retention for two and four-year institution faculty members. The results of these studies have ranged from salary having no effect to salary being the primary factor in job satisfaction and intent to leave (Ambrose, Huston, & Norman, 2005; Fugate & Amey, 2000; Gomez-Mejia & Balkin, 1984; Rojagopal, 2004; Rosser, 2005; Valadez & Antony, 2001; Winter & Petrosko, 2007). Gender and ethnicity are by far the most researched indicators on retention, job satisfaction, and intent to leave in two and four-year faculty, but this research has produced conflicting conclusions as well (Corbin, 2001; Gahn & Twombly, 2001; Hardy & Laanan, 2006; Niemann & Dovidio, 2005; Okpara, Squillace, & Erondy, 2005; Opp & Gosetti, 2002b; Townsend, 1998). Even with the extensive amount of research on faculty at two and four-year institutions of higher education, little is known about the career experiences and indicators of job satisfaction within allied health faculty, nor have the methods used to research two and four-year faculty been applied to this group of educators.

Statement of the Purpose

The purpose of this study was to examine the predictive power of selected extrinsic and intrinsic indicators, collectively and individually, as determinants of overall job satisfaction among faculty in diagnostic radiological technology, nuclear medicine technology, and radiation therapy educational programs.

Definition of Terms

Nuclear Medicine Technology

The Joint Review Committee on Educational Programs in Nuclear Medicine Technology (JRCNMT) defined nuclear medicine as the medical specialty that utilizes the nuclear properties of radioactive and stable nuclides to make diagnostic evaluations of the physiologic and/or anatomic conditions of the body and to provide therapy with unsealed radioactive sources. The Nuclear Medicine Technologist is an allied health professional who, under the direction of an authorized user, is committed to applying the art and skill of diagnostic evaluation and therapeutics through the safe and effective use of radionuclides. Responsibilities include, but are not limited to: preparation, quality control testing and administration of radioactive compounds; execution of patient imaging procedures including computer processing and image enhancement; laboratory testing; patient interviews; instruction and preparation for administration of prescribed radioactive compounds for therapy; quality control; and radiation safety. The nuclear medicine technologist exhibits professionalism in the performance of these duties, demonstrates an empathetic and instructional approach to patient care, and maintains confidentiality of information as required. He/she applies knowledge of radiation physics and safety regulations to limit radiation exposure of the general public, patients, fellow workers, and self to as low as reasonably achievable (ALARA). Professional growth and development is achieved through appropriate utilization of new technologies such as PET cross-sectional fusion technology and participation in medical and technical education and research to enhance the quality of patient care (JRCNMT, 2009).

Diagnostic Radiologic Technology

The American Society of Radiologic Technologists (ASRT) defined radiologic technologists as the medical personnel who perform diagnostic imaging examinations and administer radiation therapy treatments. They are educated in anatomy, patient positioning, examination techniques, equipment protocols, radiation safety, radiation protection, and basic patient care. Radiologic technologists who perform imaging examinations are responsible for accurately positioning patients and ensuring that a quality diagnostic image is produced. They work closely with radiologists, the physicians who interpret medical images to either diagnose or rule out disease or injury (ASRT, 2009)

Radiation Therapy

The ASRT defined a radiation therapist as the health care professional who administers targeted doses of radiation to the patient's body to treat cancer or other diseases. As the radiation strikes human tissue, it produces highly energized ions that gradually shrink and destroy the nucleus of malignant tumor cells. Radiation therapists are highly skilled medical specialists educated in physics, radiation safety, patient anatomy, and patient care. They typically see each of their patients three to five days a week throughout a four- to seven-week treatment plan (ASRT, 2009).

Research Questions

The following research questions guided this study.

1. Do the combined scores of six specific extrinsic indicators and the combined scores of seven specific intrinsic indicators significantly predict nuclear medicine technology, diagnostic radiologic technology, and radiation therapy faculty members' perception of their overall job satisfaction; if so, what is the magnitude of the contribution of each?

2. Do the combined scores of four personal characteristics and the combined scores of four job characteristics significantly predict nuclear medicine technology, diagnostic radiologic technology, and radiation therapy faculty members' perception of their overall job satisfaction?

3. Is there a clear distinction between the significance of extrinsic and intrinsic factors on overall job satisfaction, which would suggest Herzberg's duality theory of motivators and hygiene factors can be verified within the context of allied health education?

CHAPTER II

LITERATURE REVIEW AND CONCEPTUAL FRAMEWORK

This chapter begins with the evolution of management approaches to job satisfaction and motivation over the past century, then describes the literature on leadership studies, and then reviews the relevant theories of job satisfaction in allied health and non-health settings. I will then discuss Herzberg's motivation-hygiene theory for management and its applicability to allied health care faculty. Finally, I will conceptualize the framework used for this study of predictors of extrinsic and intrinsic indicators of overall job satisfaction in allied health faculty

Management Approaches Throughout the Last 130 Years

Scientific Management

The first major revolution in the theoretical and practical application of management theory in the United States began around 1880 when Frederick W. Taylor, a supervisory engineer, began to study workers. Taylor deconstructed work into its individual tasks, studied each component of a task, and considered the time it should take to perform the task. He then assessed the best way to perform the task and established instructions for the workers to follow in order to most efficiently complete the work (Birnbaum, 2001). Taylor factored the worker's ability out of the equation and assumed that a high salary was the key to overall job satisfaction. This led him to propose a differential piece-rate pay scale that rewarded workers based on the amount of product

they produced rather than an hourly rate which was the norm for the time (Taylor, 1911). The official name of Taylor's theory was "scientific management," but due to its massive adoption throughout the industrial world and to its contributions to the management literature, it is most widely known today as "Taylorism" (Birnbaum, 2001).

Taylor's method focused on the managers of the factory and broke their responsibilities down into four distinct parts. First, managers were to develop effective plans for each task related to the employees' work. Next, the managers were to systematically select workers for each task and train them for that specific task. The managers were then required to work closely with the workers to make sure the work transpired efficiently and according to the instruction. Finally, the responsibility for the work was shared between the manager and the workers equally (Taylor, 1911).

Taylorism was not limited to factories and blue-collar workers. In the early 1910's, the Carnegie Foundation for the Advancement of Teaching led a push to investigate the value of Taylor's ideas as applied to the higher education environment. They recruited Morris Llewellyn Cooke, a mechanical engineer, and charged him with applying a modern business management approach to the day-to-day operations of colleges and universities. Cooke found a lack of uniformity among different institutions in higher education and suggested the idea of a "credit hour" unit as a way of measuring efficiency. The impact on higher education was profound and bureaucracies developed with the intent to manage and account for the delivery of higher education. The college professor lost some individual independence and was now held more accountable to management, much like workers in other occupations (Birnbaum, 2001). By the end of

the 1920's, business was under the leadership of efficiency experts, and was subject to time and motion studies as well as incentive plans (Craig, 1987). While Taylorism proved to be a valuable new way of performing work, it dehumanized the workers and suggested that salary was the only incentive necessary for higher production levels. The period right before the Great Depression saw a change in the sociopolitical climate and the human relations movement was underway.

The Human Relations Movement

The Great Depression of the 1930's signaled a significant challenge for scientific management. The large number of unemployed workers and the shrinking market for produced goods led to a backlash against management. Unions began to form and collective bargaining was legalized with the passage of the Wagner Act in 1935 (Kreitner, 1989). In response to unionization, the Hawthorne studies, and the developing industrial humanistic theory, managers determined that satisfied employees would be less likely to join unions (Kreitner, 1989; Magnusen, 1977). Thus began the human relations movement in management.

With the realization that satisfied workers were the key to higher productivity, behavioral scientists began to perform on-the-job behavioral studies. The most notable of these studies were the Hawthorne studies. In 1924, the National Research Council (NRC) of the National Academy of Sciences initiated a study of how illumination affected workplace efficiency at the Cicero, Illinois, Hawthorne Plant of Western Electric. The initial study was so inconclusive that the investigators were prepared to abandon the

research, but a team of Harvard University industrial psychologists became involved and continued the research by dividing it into four stages:

1. Experiments performed to determine the effects of illumination on productivity.
2. Experiments performed to determine the effects of changing working hours and other factors (rest periods, refreshments, etc.) on productivity.
3. The researchers interviewed all of the plant workers with the intent of gauging their attitude and sentiments toward their work.
4. Worker determination and evaluation of social organizations at the plant were measured.

After three years, the researchers concluded that physical conditions and wage incentives did not affect productivity significantly, but the attention applied to each subject by the researcher did increase their productivity. The researchers proposed that the work group as a whole determined the individual worker's output by applying an informal norm of what a fair day's work should be. They also concluded that group acceptance and security had the highest influence on individual productivity. Although critics attacked the Hawthorne studies for their lack of scientific objectivity, they changed the way behavioral scientists viewed workers. The pendulum was swinging away from the dehumanizing view of scientific management toward a more personalized view. Thus, the worker, rather than the output, became the focus and the behavioral science approach was born.

The Behavioral Science Approach

In the early 1950's, the Foundation for Research on Human Behavior was established. Its purpose was to promote and support behavioral science research in organizations, business, and government (Donnelly, Gibson, & Ivancevich, 2000). Filley, House, and Kerr (1976) defined behavioral science as "The study of observable and verifiable human behavior in organizations, using scientific procedures. It is largely inductive and problem centered, focusing on the issue of human behavior and drawing from any relevant literature, especially in psychology, sociology, and anthropology" (p.16). Behavioral science promoted the use of self-motivation, participation, quality of work life, new organizational designs, team building, job enrichment, and other psychologically based techniques for the purpose of improving productivity (Donnelly et al., 2000). This new idea of industrial humanism suggested that productivity increased when managers motivated their employees rather than just demanding higher output.

McGregor (1960) proposed two sets of assumptions about human nature that added to the behavioral scientists philosophical base, Theory X and Theory Y. Theory X asserted that people had a built-in dislike for work and avoided it whenever they could. This negative attribution toward work required managers to threaten employees with punitive means in order to motivate them to perform their assigned work. Managers who subscribed to Theory X viewed their employees as being interested only in job security, lacking ambition, and consistently avoiding responsibility. These employees preferred constant, specific instruction in how, when, and where to perform their work.

The counter theory offered by McGregor (1960), Theory Y, took a more positive approach to human nature, and proposed that people needed physical and mental work. Workers would demonstrate self-direction and self-control in achieving objectives if they had a stake in the work. These workers, rewarded for their achievements, would pursue responsibility and demonstrate creativity and ingenuity toward their work. McGregor (1960) also suggested that organizations failed to capitalize on the intellectual potential of their employees.

Behavioral scientists, in agreement with their humanistic counterparts, suggested that employees should be the focus for improving productivity and that the success of an organization depended on the commitment of its employees to the organization's objectives (Herzberg, 1969; Locke, 1969; Maslow, 1954). Thus, the goal of behavioral and humanistic scientists was to make managers understand that employees' needs should be their focus and that to achieve higher levels of productivity involved identifying the multiple determinants associated with job satisfaction.

Motivation Theories

Scientific management theory made a significant impact on worker production and organizational research, but it was limited in scope and failed to account for motivation. The solution for explaining why one worker consistently displays greater productivity, works harder, and seeks out more responsibility than other workers who are equally educated and talented is most likely motivation (Herzberg, 1968; Salmore, 1990; Steers & Porter, 1987). Learning what motivates their employees should provide managers with the information necessary to improve or enhance employee job

performance. However, Kovach (1987) discovered that managers and workers unknowingly disagreed as to what motivated the workers' job performance (Table 1). Kovach (1987) surveyed 1,000 industrial workers in the U.S. (622 men; 378 women) and ranked their responses on 10 job factors that had motivational foundations. He then surveyed 200 supervisors and asked them to rank the same 10 job factors as they felt their employees would respond. Table 1 demonstrates the disparity in responses between the managers and workers.

TABLE 1

Managerial Misperception of Employee Desires

Job Performance Motivators	Managerial Ranking	Employee Ranking
Good Wages	1	5
Job Security	2	4
Promotion and Growth Potential	3	6
Good Working Conditions	4	7
Interesting Work	5	1
Organization Loyalty to Employees	6	8
Assistance for Personal Problem	7	10
Employee Appreciation	8	2
Tactful Discipline	9	9
Feelings of Being Included	10	3

Adapted from Kovach, K.A. (1987).

Mitchell (1982) asserted that motivation is the psychological process that gives a person's behavior direction and purpose. An employees' motivation could be determined by observing what they said or did in a given work situation. The intent to involve employees in organizational objectives by managers demonstrated the managers concern with the employees' behavior. Therefore, assumptions made about the what and how of an employee's intentional or purposeful behavior are related to motivational theories (Steers & Porter, 1987). The dominant motivational theories that address job satisfaction include Maslow's need-fulfillment theory, Herzberg's two-factor theory, and the perceived reward theory.

Need Fulfillment Theory

Maslow (1954) stressed that man's primary motivation is self-actualization. He developed a hierarchy of needs (Figure 1) in which the goal of humanity is to successfully achieve the low-order needs of physiological desires (food, water) and safety and security (shelter, freedom from physical harm) before achieving the higher-order needs of belonging and love (affectionate relationships), esteem (recognition, respect), and finally self-actualization. Maslow (1970) further divided the esteem needs into two ancillary subsets. The first subset involved a person's desire for strength, achievement, and confidence. The second subset involved a person's desire for reputation, dignity, and appreciation. Finally, after achieving the level of esteem, humanity can achieve self-actualization. Individual differences are significant from person to person at this level, but if a person reaches this level then they considered themselves worthwhile and accepted and respected by others (Maslow, 1970). Management, Maslow (1954)

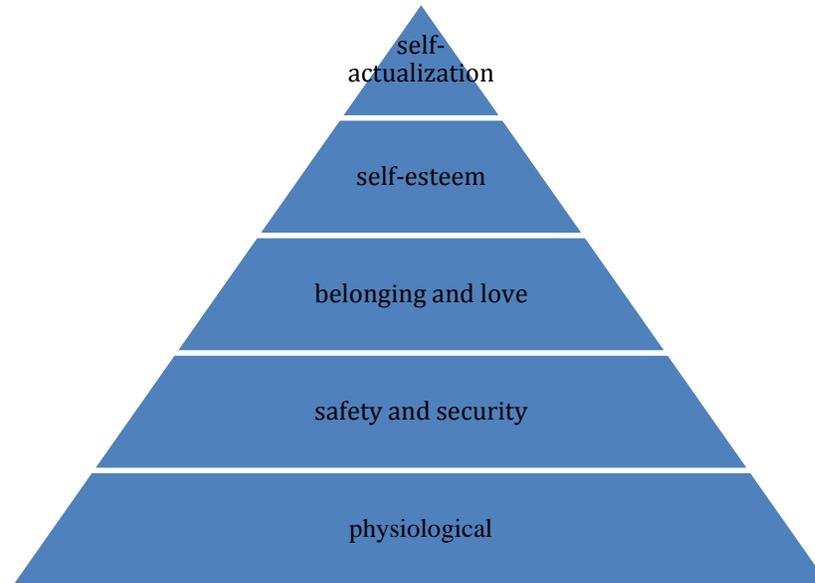
suggested, strived to meet the lower-order needs of their workers because workers with self-respect and self-esteem exhibited higher levels of motivation in regards to the organization's objectives.

Centers and Bugental (1966) indicated that Maslow's need fulfillment theory was applicable to job satisfaction studies of workers at different occupation levels. Their study suggested that people in lower-level occupations appeared motivated by the lower-order needs whereas people in higher-level occupations appeared motivated by the higher-order needs. Reiss and Havercamp (2005) provided more support for Maslow's theory suggesting that younger adults strived more for lower-order needs whereas older adults focused more on higher-order needs. Maslow (1970) stated:

I am confining the concept of self-actualization very definitely to older people. By the criteria I used, self-actualization does not occur in young people... They have not yet achieved identity, or autonomy, nor have they had time enough to experience an enduring, loyal, post romantic love relationship, nor have they generally found their calling. (p. xx)

The value of a self-actualized person to an organization is questionable. Mitchell and Moudgill (1976) stressed that although these employees may generate new ideas and behaviors within the organization, these new ideas and behaviors may create chaos within a highly structured organization and be detrimental to the organization's objectives.

Figure 1 Maslow's Hierarchy of Needs



Adapted from Maslow (1954).

Criticism of Need Fulfillment Theory

Locke (1969) and Lawler (1973) criticized Maslow's insistence that one need had to be met and sustained prior to the person moving to the next level. They suggested that most individuals simultaneously strived for the higher-order needs rather than achieving them in a hierarchical manner. Locke (1969) also argued the significance of measuring what is important to a person rather than just what they need. Locke suggested that Maslow's theory was insufficient for providing a major theoretical framework for studying job satisfaction since there was no convincing evidence that a person attains each level of need in a specific order. Betz (1984) added to Locke's criticism by suggesting that Maslow's theory was also not viable as a framework for measuring worker motivation, because once individuals achieve the lower-order needs they will

strive for the higher-order needs based on their particular desires rather than in a specific order.

Herzberg (1982) supported Maslow's theory as a valuable foundation for behavioral scientists, but suggested that it failed to portray individuals in a holistic manner. Humanity's constant need for assurance of safety and security, combined with the continuous socialization of society and the quest for status symbols led Herzberg (1982) to believe that the lower needs were never fully satisfied. This realization motivated Herzberg to create his own theoretical framework, which he named the Motivation-Hygiene Theory.

Motivation-Hygiene Theory

In 1959, Frederick Herzberg published a book titled *The Motivation to Work*. In the book, Herzberg outlined interviews with 200 accountants and engineers. The interviewees were asked to describe "any kind of story you like – either a time when you felt exceptionally good or a time when you felt exceptionally bad about your job" (1959, p.35). Herzberg et al. (1959) performed the same research in twelve other organizations similar to the first. He identified trends in the responses and classified them into two categories labeled motivators and hygiene factors. Motivators were the satisfying events described by the respondents and included achievement, recognition, work itself, responsibility, advancement, and growth. Herzberg also described motivators as being intrinsic to the employee (Table 2).

Herzberg et al. (1959) identified ten events that employees recalled as making them feel exceptionally bad and labeled them hygiene factors. Hygiene factors included

company policy and administration, supervision, relationship with supervisor, work conditions, relationships with peers, relationships with subordinates, personal life, salary, status, and security. Herzberg et al. (1959) described the hygiene factors as events that detracted from job satisfaction by disrupting the external work context. This new duality theory of job satisfaction countered the ideas of the traditional organizational researchers of the time by challenging their notion that factors affected employees on a uniscalar continuum (Smerek & Peterson, 2007). For example, the traditional notion dictated that an increase in factors like salary or company policy alone should increase job satisfaction. Herzberg's theory suggested that you could not improve job satisfaction through an increase of the hygiene factors, only through the motivators. Herzberg (1987) stated that, "The opposite of job satisfaction is not job dissatisfaction, but, rather, *no* job satisfaction; and similarly, the opposite of job dissatisfaction is not job satisfaction, but *no* job satisfaction" (p.4). This concept was in stark contrast to the current thinking of the time and created a significant controversy (Behling, Labovitz, & Kosmo, 1968).

Herzberg (1982) urged managers and administrators to reconsider what motivated their employees. He supported his argument by explaining that the satisfaction-dissatisfaction continuum was a line that contained a zero point where an employee could experience both satisfaction and dissatisfaction concurrently. For example, an employee may be happy with the general working conditions of their position, but at the same time not be motivated to work hard due to a lack of challenge in the work itself. Herzberg (1966) further explained this concept by stating that managers could only achieve the zero midpoint of job satisfaction through the use of the extrinsic hygiene factors.

Managers would have to provide challenging, meaningful, interesting work in order to exceed the zero point.

Herzberg (1982) further established the argument for extrinsic and intrinsic factors by describing four prototypes of normal employees. If a manager perceived their employees as not fitting one of the four prototypes of a normal employee then they should “enhance the overall supply of hygiene factors and distribute them equitably among employees” (Herzberg, 1976, p. 82). The four prototypes were the employee who “exists in the best of all possible worlds” (Herzberg, 1982, p. 62), the “starving artist” (p. 63), the “I’m all right Jack” (p. 64), and the “down and out situation” (p. 65). The first prototype referred to an employee who had all of their needs met and was thriving. The second prototype referred to an employee who was happy about what they were doing, but unhappy with their life’s circumstances. The third prototype referred to an employee who felt well treated by their employer, but felt the work was meaningless. The final prototype described an employee who was not having their extrinsic or intrinsic needs met (Herzberg, 1982).

Criticism of Motivation-Hygiene Theory

Several criticisms of Herzberg’s theory emerged, one being House and Wigdor (1968), who analyzed several research studies using the two-factor theory and identified some deficiencies. First, they challenged the validity of Herzberg’s categorization procedures due to the possibility of contamination by the rater. Second, they found Herzberg’s theory to be too restrictive because some factors contributed to satisfaction in one participant while contributing to dissatisfaction in another. House and Wigdor (1968)

also suggested that several factors, such as age, sex, and level of education could influence how both the intrinsic and extrinsic rewards contributed to overall job satisfaction.

TABLE 2 Herzberg's Two-Factor Theory of Motivation

<u>Employee Satisfiers (Intrinsic)</u>	<u>Employee Dissatisfiers (Extrinsic)</u>
Achievement	Working Conditions
Advancement	Policies and Procedures
Growth	Job Security
Work Itself	Personal Life
Responsibility	Status
Recognition	Salary
	Co-worker Relationships
	Employee-Supervisor Relationship
	Supervision
	Security

Adapted from Herzberg, F.H., Mausner, B. & Snyderman, B. (1959)

Another criticism of Herzberg's two-factor theory came from Vroom (1964) and Gruenberg (1979) who claimed that he ignored the possibility that the hygiene factors could actually produce an increase in satisfaction for some workers. They also suggested that Herzberg's use of the critical incident technique for acquiring his data did not provide an adequate basis for his theoretical model. In addition, Gruenberg (1979)

suggested that the motivators used in Herzberg's theory had the potential to contribute to satisfaction and dissatisfaction rather than just having a positive attribute. Vroom (1964) argued that Herzberg was only exposing people attempting to make themselves "look good" by attributing positive outcomes to themselves and applying negative experiences to external factors.

Even with these criticisms and over 50 years for the development of other theories, such as perceived reward theory, Herzberg's two-factor theory still has relevance. In the past three years alone researchers have applied the theory as a basis for studies on non-academic university employees (Smerek & Peterson, 2007), management in the Irish healthcare system (Byrne, 2006), 32 random organizations in the United Kingdom (Basset-Jones & Lloyd, 2005), psychiatric registered nurses in New England (Sharp, 2008), and employees at a Christian university (Brown & Sargeant, 2007; Schroder, 2008). Thus, the theory should provide a solid basis for developing the instrument for research on the job satisfaction of allied health faculty.

Perceived Reward Theory

Some of the critics of Herzberg's two-factor theory utilized an even older model called the expectancy model. This model was originally developed by Tolman in the 1930's, but became popular again in the 1960's (Georgopoluus, Mahoney, & Jones, 1957). This model retained its popularity and in the 1980's was renamed the perceived reward model (Mottaz, 1981, 1985, 1986, 1987; Mottaz & Potts, 1986). As a conceptual framework for job satisfaction, the perceived reward model based itself in a social psychological or interactionist theoretical framework that evaluates the nature of work

from the perspectives of work rewards and work values. Work values were comprised of the intensity and content of the work and work rewards were comprised of intrinsic task rewards, extrinsic organizational rewards, and extrinsic social rewards.

The focus of perceived reward theorists was what caused an employee to work in a situation where the employee was dissatisfied with their job. Gruenberg (1979) and Vroom (1964) described the theory as focused on what people expect as an acceptable reward for their work and considered all work as voluntary. The core premise of the perceived reward model is that job satisfaction only occurs when the work leads to rewards that the person perceives as equitable to the effort expended and that the rewards are fair in comparison to the worker's peers. Perceived reward theory assumes that workers behave based on their perception of the environment, which then guides them in determining what effort is needed and what outcomes will emerge (Lawler, 1967).

Vroom (1964) further developed and popularized the theoretical framework in the 1960's. He suggested that motivation was the result of expectancy, valence, and instrumentality. Vroom (1964) defined expectancy as an individual's perceptions that a given behavior would likely lead to a particular outcome. For example, if an employee perceives that working harder would increase performance then they have a high expectancy. Conversely, if the worker perceives that higher performance would result in a negative response from co-workers then they have a low expectancy (Gordon, 1991). Vroom (1964) defined valence as the positive or negative value a worker placed on outcomes. A high valence value results from a person feeling positive about the possible outcome and resulted in higher motivation. A low valence value resulted from an

employee with negative feelings about the possible outcomes. Vroom (1964) asserted that the valence value arose from the level of satisfaction received from an outcome, not its actual value. Instrumentality, the final component of Vroom's (1964) equation, pertained to the probability that a certain outcome resulted from performance. For example, if a person believed that higher pay would result from increased production, then high instrumentality existed.

Criticism of the Perceived Reward Theory

Early critics of the perceived reward or expectancy theory found conceptual and methodological problems. They took issue with the theories complexity, its lack of consistent definitions, its operationalizations of performance, effort, and valence, and the failure of its repeated measures to prove valid over time (Connolly, 1976; House, 1974). Other behavioral scientists pointed out that the model only included personal expectations and ignored factors such as social and cultural norms (Miller & Grush, 1988). Roberts and Hunt (1991) expressed the criticism that the model contained too many "ifs." They argued that a manager could only implement the model if the workers were aware of all of the possible alternatives, outcomes, relationships, and how they would feel about the outcomes prior to making a valuation. Gordon (1991) argued that the model was supported empirically and provided managers with viable tools that enhanced employee motivation.

Leadership Studies and Organizational Climate

Parallel to motivational research and its impact on job satisfaction is research on leadership and organizational climate. Astin and Astin (2000) defined a leader as “...anyone – regardless of formal position – who serves as an effective social change agent. In this sense, every faculty and staff member, not to mention every student, is a potential leader” (p. 2). Throughout history, leaders have been studied and scrutinized to determine what traits they possess that give them the ability to lead. Given the importance of leadership in all facets of higher education and its importance to job satisfaction and motivation, it is interesting that academically, it has only emerged as a recognized school of research-based study in the last 60 years. In this section, I will review the evolution of leadership studies in higher education starting in the era of World War II and continuing through to modern time.

The Ohio State Leadership Studies

Research on leadership prior to 1950 focused on leadership primarily as a personality trait or group of traits and failed to produce a consistent model of which traits predicted leadership success (Schrieshem & Bird, 1979). A group of researchers at Ohio State University led by Carroll Shartle and Ralph Stogdill decided to move away from the trait-based approach of studying leadership and instead look at the behaviors expressed by leaders and their effects on various individual, group, and organizational outcomes (p. 138). The majority of Shartle and Stogdill’s studies involved leaders in the United States military. From their initial work with the military, they developed a questionnaire and administered it to individuals in many different organizations, both governmental and

private. The questionnaire asked the participant to describe their leaders by the frequency with which they displayed certain behaviors, ranking the behaviors on a continuum from “always” to “never.” Analysis of these ratings revealed four major factors, two of which represented a landmark in leadership research. They found that the factors of “consideration” and “initiation of structure” accounted for the bulk of leader behavior (Hollander, 1979).

Consideration, the first factor, involved the degree of communication, mutual trust, respect, consultation, and warmth a leader exhibited toward his followers. A high score on consideration meant that the leader’s subordinates agreed with descriptions such as "He makes those feel at ease when talking to them," "He is friendly and approachable," "He looks out for the personal welfare of group members," and "He puts suggestions into operation." If the subordinates disagreed with these descriptions, the leader would receive a low score (Hollander, 1979).

Initiating structure, the second factor, involved how thoroughly the leader defined and organized relationships among group members, established channels of communication, and defined methods of accomplishing the group's task. A high score on initiating structure meant that the leader’s subordinates agreed with descriptions such as "He assigns people to particular tasks," "He schedules the work to be done," "He asks that group members follow standard rules and regulations," and "He emphasizes deadlines." If the subordinates disagreed with these descriptions, the leader would receive a low score. Jago (1982) stressed, “It is important to emphasize that consideration and initiating structure are not opposite ends of a single leader behavior continuum, but are

instead separate and conceptually independent dimensions” (p. 319). It was possible for a leader to score high on one factor and low on another, high on both factors, or to score any combination of the two due to the independent nature of the two factors. The Ohio State Leadership Studies determined that the goal of developing a leader was to focus on improving their performance on both factors.

The results of the Ohio State Leadership Studies were profound. Researchers prior to this time struggled to identify leaders by using models that attempted to identify personal traits they felt were inherent in the individual. The new behavioral approach to leadership attempted to identify those factors that would be useful in training leaders. “Conceptualizing leadership in terms of behavior patterns of the leader suggests that effective leadership is an acquired skill and can therefore be taught” (Jago, 1982, p.320).

The University of Michigan Studies

In the late 1940’s, similar research was taking shape at the University of Michigan. It began with Rensis Likert, an organizational psychologist, who founded the University of Michigan’s Institute of Social Research. The Michigan Studies took place primarily in the 1950’s and 1960’s, and similar to the Ohio State Leadership Studies, they based their research on the behavior of the leader through the eyes of the subordinates. What distinguished the Michigan Studies from the Ohio State studies is that they viewed leadership as having only one dimension. Leaders were either job-centered or employee-centered. A leader existed somewhere on the continuum between these two extremes. These studies began the Human Relations Movement in organizational behavior. Based on these studies, a leader’s goal was to become more employee-centered to improve their

effectiveness. In addition, participative management and teams were encouraged based on these studies (Shipper, 2009).

The Michigan Studies went even further than the Ohio State Studies and identified three critical characteristics of effective leaders: task-oriented behavior, relationship-oriented behavior, and participative leadership. Task-oriented behavior related to the researchers concluding that effective leaders did not do the same type of work as their subordinates. Their tasks included planning and scheduling work, coordinating activities and providing necessary resources. They were effective because they guided their subordinates by setting task goals that were both challenging and achievable. Relationship-oriented behavior related to the effective leaders' ability to not only concentrate on the task, but to also concentrate on the relationship with their subordinates. The effective leaders were considerate, helpful, and supportive of subordinates, and helped them with their career and personal problems as needed. Effective leaders utilized intrinsic as well as extrinsic reward systems that recognized the effort of subordinates. The effective leaders did not micromanage the day-to-day work. Instead, they set goals, provided guidelines, and then provided the workers with plenty of leeway on completing the assigned goals. Participative leadership related to the effective leaders' use of a participative style of management in which they involved all of the individual workers in the group. The effective leaders modeled good team-oriented behavior. The goal of participative leadership is to build a cohesive team that works together rather than individually ("Michigan studies," 2009).

The University of Michigan Studies built upon the canon of knowledge created by the Ohio State Studies and added the concept of participative leadership. Participative leadership, also known as democratic leadership, provided a means for subordinate information, expertise, and creativity to be used on problems where the leader's own knowledge may be insufficient. It created an organizational climate where constructive conflict is encouraged, thus allowing multiple perspectives of a problem to be pursued (Jago, 1982).

Drawbacks of the Behavioral Approach to Leadership Studies

Both the Ohio State and Michigan bodies of work were groundbreaking at the time and the wide spread and repeated use of the instruments from both universities provided validity for researchers who were desperate for a way to quantify effective leadership. Both works also had major drawbacks in that they suffered from being situational in nature. Another major drawback was that no overwhelming evidence exists to support the theory that participative or democratic leadership is effective. Locke and Schweiger (1978) reviewed 46 studies testing the effects of participative leadership on work group productivity and 43 studies testing the effects of participative leadership on work group satisfaction. Using productivity as the sole criterion, only 22 percent of the studies found participative leadership to be more effective than an autocratic approach, 56 percent of the studies found no significant difference between them, and 22 percent found the participative approach to be inferior. Using work group satisfaction as the sole criterion, Locke and Schweiger (1978) found that only 60 percent of the studies supported participative leadership over autocratic, 30 percent revealed no significant

difference, and 9 percent of the studies suggested that participative leadership was inferior to autocratic.

The Ohio State and Michigan theories on leadership, as well as the universal trait theories that preceded them, both failed by assuming that there is one best way to lead. They assumed that there was a generic set of traits or behaviors distinguishing effective leaders from ineffective ones. Unfortunately, the empirical evidence did not support their assumptions (Jago, 1982). They did, however, advance the study of leadership exponentially and provide the impetus for further research.

Situational Contingencies Impact on Leadership Studies

The primary disappointment of the trait and behavioral approaches to understanding effective leadership led scholars to conclude, “Leadership depends on the situation” (Jago, 1982, p. 322). In order to account for all of the possible situational contingencies required a model of effective identification. In 1964, Fred Fiedler, a business and management psychologist at the University of Washington, introduced his contingency model of leadership. Fiedler argued that group productivity is dependent on a match between the personality traits of the leader, labeled task versus relationship motivation, and the favorableness of the leadership situation. Fiedler and his associates created the Least Preferred Co-worker (LPC) scale, which measured an individual’s leadership orientation. Using Fiedler’s model, the leader would describe the person they found to be the most unpleasant to work with. Leaders describing the person in a favorable light were labeled “high LPC leaders” and leaders describing the person in a less favorable light were labeled “low LPC leaders.” Fiedler argued that both types of

leaders could be effective, but leaders demonstrating high LPC scores were more concerned with interpersonal relations, while low LPC leaders were more concerned with task-relevant problems. Fiedler referred back to the Ohio State researchers by using the terms “considerate leadership” in describing the high LPC leaders and “structuring leadership” in regards to the low LPC leaders (Fiedler, 1964).

The second component of Fiedler’s model was termed “situation favorableness.” According to Fiedler, there is no ideal leader. Both low-LPC and high-LPC leaders can be effective if their leadership orientation fits the situation. Fiedler’s contingency theory defined the appropriate situations for effectiveness by determining three situational components:

1. Leader-Member Relations – describes the degree of mutual trust, respect, and confidence between the leader and the subordinates.
2. Task Structure – described the extent to which group tasks are clear and structured.
3. Leader Position Power – described the power inherent in the leader's position itself.

If a leadership situation meets all three components then a "favorable situation" exists. Fiedler argued that low-LPC leaders are more effective in the extremes of favorable or unfavorable situations, whereas high-LPC leaders perform best in situations ranked between the two extremes. Fiedler concluded that it was not meaningful to label a leader effective or ineffective without evaluating the situation where the leadership takes place (Fiedler, 1967). The theory did not propose that leaders could adapt their leadership

styles to different situations, but that leaders with different leadership styles would be more effective when placed in situations that matched their preferred style.

Several other models surfaced shortly after Fiedler published his research. The two most notable models are the Path-Goal theory and the Vroom/Jago model. Robert House, an Ohio State graduate, first presented his idea of the Path-Goal Theory in 1971. House's theory proposed that subordinates' characteristics and the characteristics of the work environment determine which leader behaviors will be more effective. Locus of control, work experience, ability, and the need for affiliation are key characteristics of the subordinates. The nature of the task, formal authority system, and the nature of the work group are the key environmental characteristics. The theory includes four different leader behaviors, which include directive leadership, supportive leadership, participative leadership, and achievement-oriented leadership. According to the Path-goal theory, the goal of a leader's behavior is to reduce barriers to their subordinates' goal attainment, strengthen their subordinates' expectancies that improved performance leads to valued rewards, and coach the subordinates in order to make the path to payoffs easier. The leader's behavior that will accomplish these tasks is dependent on the subordinate and on environmental contingency factors (House, Filley, & Kerr, 1971).

The second notable model resulting from the contingency theory line of research was the Vroom-Yetton-Jago decision-making model. Introduced by Victor Vroom and Phillip Yetton in 1973 and revised by Vroom and Jago in 1988, the theory focused primarily on the degree of subordinate participation that is appropriate in different situations, emphasizing the decision-making style of the leader. The model is narrower in

its focus, concentrating only on the behavior of a formally designated leader in specific decision-making situations (Vroom, 2007). The model defines five types of leader decision-making styles ranging from strongly autocratic, to strongly democratic. The appropriate style is determined by measuring the answers of up to eight diagnostic questions, relating to contingency factors such as the importance of decision quality, the structure of the problem, the amount of information subordinates have to make a quality decision, and the importance of subordinate commitment to the decision.

Despite criticism for its complexity, for its assumption that the decision makers' goals are consistent with organizational goals, and for ignoring the skills needed to arrive at group decisions to difficult problems, Vroom and Jago continue to insist that their situational model is effective. Vroom (2007) stated:

...situational variables used in predicting the consequences of a leader's choices are the same as those used in explaining the choices that a leader actually makes. The advantage of using the same situational variables in both normative and descriptive analyses is the ease with which the effectiveness of a leader's choices can be determined. One can compare a leader's choices in each situation with the choice recommended by the normative model. In this way, the overall effectiveness of a leader's choice can be determined as well as the source of his or her ineffectiveness. (p. 23)

Transactional and Transformational Leadership Theories

In 1978, James M. Burns published his classic study of leadership. His work, based on Kohlberg's levels of moral thinking, differentiated between transactional and transformational leadership. Transactional leadership focuses on role and task requirements and utilizes rewards contingent on performance. By contrast, transformational leadership focuses on developing mutual trust, fostering the leadership

abilities of others, and setting goals that go beyond the short-term needs of the work group. Transactional leadership "requires a shrewd eye for opportunity, a good hand at bargaining, persuading, reciprocating" (Burns, 1978, p. 169). A "transformational leader," on the other hand, "recognizes and exploits an existing need or demand of a potential follower... (and) looks for potential motives in followers, seeks to satisfy higher needs, and engages the full person of the follower" (p. 4).

In 1985, Bernard Bass published a transformational leadership theory that adds to Burn's initial concepts (Bass, 1999). Bass's transformational leadership theory identifies four aspects of effective leadership that include charisma, inspiration, intellectual stimulation, and consideration. A leader who exhibits these qualities transforms the followers to be high achievers and inspires them to put the long-term interests of the organization ahead of their own. The followers feel trust, admiration, loyalty, and respect toward their leader and will do more than they expected in the beginning. Bass's research evolved the theory and with the help of Bruce Avolio, they created the full range of leadership model. This model introduced four elements required of a transformational leader. The elements included individualized consideration, intellectual stimulation, inspirational motivation, and a role and identification model (Bass & Avolio, 1993). Bass's research also created the Multifactor Leadership Questionnaire (MLQ), an instrument that has become a valuable standard in transformational leadership research (Yukl, 1999).

Another important concept introduced by researchers in transformational research is the importance of organizational climate and culture. Bass and Avolio (1993) stress the importance of the relationship by stating:

There is a constant interplay between culture and leadership. Leaders create mechanisms for cultural development and the reinforcement of norms and behaviors expressed within the boundaries of the culture. Cultural norms arise and change because of what leaders focus their attention on, how they react to crises, the behaviors they role model, and whom they attract to their organizations. The characteristics and qualities of an organization's culture are taught by its leadership and eventually adopted by its followers. (p. 113)

This focus on the leaders' impact on the organizational culture and climate has implications for all organizations including institutions of higher education.

Emotional Intelligence, Social Intelligence, and Biology

Recent research in leadership studies has focused on the emotional and social intelligence of leaders. This approach has allowed researchers to explain why transformational leaders are effective. Even more importantly, it allows the researchers to determine if leadership is innate or transferable. Goleman and Boyatzis (2008) stated:

If we are correct, it follows that a potent way of becoming a better leader is to find authentic contexts in which to learn the kinds of social behavior that reinforce the brain's social circuitry. Leading effectively is, in other words, less about mastering situations – or even mastering social skill sets – than about developing a genuine interest in and talent for fostering positive feelings in the people whose cooperation and support you need. (p. 76)

This movement led researchers in behavioral neuroscience to discover “mirror neurons” in the brain. The presence of these neurons is of particular importance to organizations because the neurons prompt followers to mirror the emotions and actions of their leaders.

Leadership scholars are beginning to discover why intelligent and talented people who do not possess a socially intelligent leadership style often fail to reach their leadership potential. Goleman and Boyatzis (2008) provide an example of the power of “mirror neurons”:

It turns out that there’s a subset of mirror neurons whose only job is to detect other people’s smiles and laughter, prompting smiles and laughter in return. A boss who is self-controlled and humorless will rarely engage those neurons in his team members, but a boss who laughs and sets an easygoing tone puts those neurons to work, triggering spontaneous laughter and knitting his team together in the process. A bonded group is one that performs well...Being in a good mood, other research finds, helps people take in information effectively and respond nimbly and creatively. (p. 77)

Modern researchers are finding that the behaviorists were right in the first place.

Effective leadership is a behavior and people are capable of changing their behavior.

Organizational Climate and Leadership: Implications for Higher Education

At this point, I have thoroughly developed the evolution of how leadership researchers defined an effective leader. Yet, it would be remiss not to discuss the implications effective leadership has on institutions of higher education and organizations in general. As mentioned above, organizational climate is defined by its leaders and adopted by its followers. Stringer (2002) explained:

Organizational climate exists simultaneously as a set of characteristics of the organization and as a set of insider perceptions of those characteristics. It describes the organization *as experienced* by its members, and this is what makes it such a powerful influence. (p. 5)

Ayers (2005) added that members of the organization differ in the ways in which they interpret the signs and symbols of organizational climate. Understanding the divergent ways that members make sense of their leadership's behavior and symbolism is critical for effective leadership. Ayers (2005) described higher educational institutions, particularly community colleges, as postmodern organizations. Employing a postmodern approach to organizational climate, Ayers stresses that organizations are:

...increasingly heterogeneous, not only in terms of cultural and ethnic diversity, but also in terms of socioeconomic status, disciplinary affiliation, and overall world view, among others. Consequently, it is plausible that organizational climate is a property of subsystems in organizations. (p.3)

The importance of this view of institutional organization is to gain an appreciation for the separate subsystems and to understand their independent climates and cultures within the larger organizational structure. These sub-climates are constantly changing in response to the signs and symbols from their leaders, in response to external environments, and based on their individual cultures making it a significant challenge for leaders to unite them around a common purpose (Ayers, 2005).

Likert (1981) envisioned the behaviors of a leader who would be effective in this highly complex, fractionated organization as one whom:

1. Is supportive, approachable, friendly, easy to talk to, and interested in the well-being of subordinates.
2. Builds the subordinates into cohesive, highly effective, cooperative problem-

solving teams linked together by persons who hold overlapping memberships. That is, a superior in one group is a subordinate in a higher-level group. Subordinates are not pitted against each other in hostile, competitive relationships.

3. Helps subordinates with their work by seeing that they are supplied with all the necessary resources (space, supplies, budget, training). Subordinates are kept informed of overall plans so that they can plan their work more effectively.

4. Has high performance, no nonsense goals; expects high quality performance from himself and from others. (p. 674)

Likert's vision of an effective leader still holds true today, despite the fact that Likert may have never imagined the phenomenal change in communication that has resulted from the internet and other electronic sources. What makes this leader effective is the ability to handle diversity, varied viewpoints, differing styles, and dissenting opinions. The discourse generated from the "turbulence" created by motivated employees who are responding to the work and external environments, once considered a roadblock, is now considered an asset to the organization (Gryskiewics, 1999). Enhancing constructive conflict, or "positive turbulence", enables leaders to use conflict as a way of continuously promoting creativity and an action-oriented environment. Leaders should encourage constructive conflict rather than extinguish it (Pettitt & Ayers, 2002).

Institutions of higher education are complex, multi-faceted entities serving multiple customers in an environment that is often less than supportive (i.e. state and local budgets). Multiple departments and divisions frequently operate in isolation from others with or without concern for institutional objectives. These departments have their

own mission statements and own objectives while working within the organizational boundaries set for them by the institution. Employees, either staff or faculty, develop their meaning of what it is to be a part of the organization through the discursive practices of other members in their department. The organizational climate propagates through the collective meanings members of these subunits share. For example, Ayers (2005) demonstrated four distinct climate conditions and two organizational subsystems in his study of a rural community college. The four climate conditions were power, collaboration, technology, and shared vision. The organizational subsystems, identified as discourse regimes, represented a dominant group and a subjugated group. In the first three climate conditions, the researcher found that the dominant group expressed satisfaction and inclusion while the subjugated group expressed alienation and coercion. However, on the fourth climate condition of shared vision, the researcher found that the members of both groups consistently reflected the college's mission. The implication for leadership is the importance of understanding how semiotic practices translate into employee motivation and inclusion into organizational goals. In addition, valuable members of an organization may be dissatisfied due to their perception of organizational climate. This has serious implications for the institution in that it desperately needs to retain quality teachers and instructors.

Stringer (2002) stated, "The real value of organizational climate as a concept lies in the ways that actual organizations use it to improve their performance" (p. 135).

Gaining an understanding of the organizational climate of a complex institution, such as a community college, requires the use of valid instruments. An example of an instrument

designed to measure the organizational climate of an institution is the Personal Assessment of Campus Environment (PACE) survey. Since its creation, the PACE instrument has been used by more than 100 community colleges and has developed a national norm base for benchmarking purposes. The purpose of the PACE instrument is to provide data which will assist institutional leaders in promoting more open and constructive communication among all employees, regardless of level or department. The PACE instrument evaluates four climate factors: institutional structure, supervisory relationships, teamwork, and student focus. These climate factors, deduced from researchers at the National Initiative for Leadership and Institutional Effectiveness (NILIE) led by George Baker, constitute the organizational climates that affect the institution's effectiveness. NILIE identifies four organizational systems ranging from coercive to collaborative, which is the equivalent of Likert's (1967) System 1 through System 4. Of these four systems, the goal of an institution's leadership is to achieve a collaborative organizational system. Unfortunately, few institutions measured using the PACE model have achieved the level of collaborative leadership, but the use of the model allows institutions to identify deficiencies and evaluate where they rank in regard to the four organizational climate types.

The PACE model does have some limitations. Ayers (2005) demonstrated "...that climate surveys may fail to capture the heterogeneity of meanings assigned to perceptions of climate among various organizational subsystems, particularly when subsystems enact markedly different, or even opposing discourses" (p. 17). In effect, only the dominant meanings may be represented in the results of the climate survey and a critical discourse

analysis may be more appropriate for obtaining full representation of the subsystems in the organization (Ayers, 2005). In addition, measuring the climate is not going to fix organizational issues. The leaders of the institution must be committed to organizational change and renewal before endeavoring to measure it. Finally, climate surveys only provide a snapshot of the organizational climate at a given point in time. This raises questions of when the instrument was utilized and what pressures were facing the faculty and staff at that specific point in time. "Gathering data, no matter how convenient, valid, and well presented in the written reports, is only a means to an end. The end is improving organizational performance" (Stringer, 2002, p. 137). Stringer goes on to say that when done right, utilizing the proper consulting experience, using climate surveys is a powerful tool for performance management.

Impact of Leadership and Organizational Climate on Job Satisfaction

Researchers have gone to great lengths to define the characteristics of an effective leader. Effective leadership means that the organization is successful and the employees are motivated, satisfied, creative, and innovative. The employees' perception of their work is self-actualizing. They share their fondness for the organization with co-workers and customers through discursive practices and develop positive relationships within their departments and across department lines. They perceive their role in the organization's mission, as well as policy and procedure development, as inclusive and welcoming of their inputs. Constructive conflict is encouraged by the organization and is channeled into innovative practices. No member of the organization feels marginalized. The organization is proactive to its external environment. Leaders communicate the process of change

through consistent messages that are perceived by all members of the organization as intended. Overall, the employees and leaders of the organization describe the shared experience of work at the organization as collaborative, even in a large organization with multiple departments performing completely different tasks and interacting with varied inputs and outputs from the external environment.

The above description of a successful, postmodern organization may seem like a utopian dream, but it should be the goal of an effective leader in the 21st century.

Institutions of higher education face a number of challenges today. Governance, finance, access, planning, content, delivery assessment, federal and state regulations, diversity, increased enrollments, and significant budget cuts are just a few of the issues faced by leaders in higher education (Davis, 2003). Astin and Astin (2000) eloquently define the issue facing higher education in their publication *Leadership Reconsidered*:

Higher education plays a major part in shaping the quality of leadership in modern American society. Our colleges and universities not only educate each new generation of leaders in government, business, science, law, medicine, the clergy, and other advanced professions, but are also responsible for setting the curriculum standards and training the personnel who will educate the entire citizenry at the precollegiate level. College and university faculty also exert important influences on the leadership process through their research and scholarship, which seeks both to clarify the meaning of leadership and to identify the most effective approaches to leadership and leadership education. (p.1)

Effective leadership is a constantly evolving idea and the importance of continuing research and application in leadership studies is critical for higher education and society in general. Modern research, such as Ayers (2005), is finding deficiencies in the way organizations are evaluating their need for change. Failing to identify subjugated groups

within an organization reveals a critical need for changing the type of research utilized. Part of being an effective leader is identifying the proper instrument for measuring your organizational goals, be it climate or others. Leaders in higher education must create an organizational climate that supports the needs of faculty and staff in order to achieve effective institutions armed with motivated and satisfied employees.

Faculty-Related Job Satisfaction Literature

Literature on allied health faculty members is surprisingly non-existent. A substantive amount of research exists on allied health workers in a number of different fields, but ignores the faculty members who prepare them. Fortunately, there is a staggering amount of literature available on faculty members in general from both two and four-year institutions. Hospital-based faculty members also appear ignored by researchers, with the exception of nursing. Seifert and Umbach (2008) stress the importance of taking into account the contextual role that discipline plays in job satisfaction. They suggest that faculty members in an academic field resemble one another more closely than faculty in other fields. They give the example that a woman faculty member in chemical engineering, a field in which women are underrepresented, differs in job satisfaction from her female counterpart in English (Seifert & Umbach, 2008). I am not concerned with assuming a connection between the research on faculty in other disciplines and the job satisfaction of allied health faculty because the research instrument will measure the effect of demographics on job satisfaction, not assume them. Due to the lack of research on allied health faculty, it is necessary to review the job

satisfaction literature on other faculty members in order to develop and support the conceptual framework for this study.

Personal Characteristics

A significant number of studies have focused on the effects of ethnicity and gender on the experiences and level of job satisfaction of faculty members, both in the community college (Bellas, 1997; Corbin, 2001; Gahn & Twombly, 2001; Gomez-Mejia & Balkin, 1984; Hardy & Laanan, 2006; Niemann & Dovidio, 2005; Okpara et al., 2005; Opp & Gosetti, 2002a; Townsend, 1998) and in the college and university (Bellas, 1997; Bronstein, 1993; Bronstein & Farnsworth, 1998; Dey, 1994; Hagedorn, 1996; Johnsrud, 1993; Johnsrud, 2002; Laden & Hagedorn, 2000; McElrath, 1992; Olsen, Maple, & Stage, 1995; Peluchette, 1993; Perna, 2001; Thompson & Dey, 1998; Turner, 2002; Witt & Lovrich, 1988). Seifert and Umbach (2008) reported that African American faculty did not differ in job satisfaction levels from their White counterparts, but that Latino faculty were less satisfied. In reference to teaching only, Aguirre (2000) found women and faculty of color perceived their role in the institution as delegated to teaching courses that are considered a service component rather than courses that satisfy major requirements. Women and minority faculty also frequently held dual appointments, which resulted in them developing curriculum for two departments as well as having to teach courses in both (Eimers, 1997). This affects their job satisfaction by detracting from their sense of authority in their work, which Herzberg considered to detract from motivation (Herzberg, 1987). Seifert and Umbach (2008) reported that faculty of color were less satisfied than their White colleagues in terms of their autonomy, independence, and freedom to

generate new ideas. Rosser (2005) found that intrinsic job satisfaction (Herzberg's motivators) decreased for faculty of color from 1993 to 1999. However, women and faculty of color reported high satisfaction levels with their personal research and they viewed their research as action oriented and providing a sense of coherence between work and community (Ropers-Huilman, 2000; Seifert & Umbach, 2008).

Age, career stage, and part-time or full-time status are important variables to consider when evaluating allied health faculty job satisfaction. Fugate and Amey (2000) stressed the fact that community college faculty often did not foresee an academic career when they entered higher education. Some of those who did choose the community college did so to avoid the tenure process at a four-year institution. Adjunct, full, and part-time faculty assignments also affected the perceived job satisfaction of faculty, particularly in regards to marginalization, task autonomy, and job security (Rajagopal, 2004; Valadez & Antony, 2001; Wyles, 1998). Valadez and Anthony (2002) found that even though public perception of part-time faculty suggested they were overworked and marginalized in academe, they still reported high levels of job satisfaction. Gahn and Twombly (2001) reported that the vast majority of health faculty came from positions in hospitals or the healthcare industry at mid to late stages of their career. The impact of age on faculty job satisfaction is significant. Smerek and Peterson (2007) suggested that age is an important factor due to the change in extrinsic needs (hygiene factors) experienced by workers as they approach retirement. Cockburn (1998) demonstrated that age has a U-shaped effect on job satisfaction with younger and older workers presenting higher levels

of job satisfaction and mid-career workers reported lower values. However, Muchinsky (1978) found that older workers were less satisfied than younger workers.

Another modern human resource device in use by university, college, and community college administrations is limited-term full-time faculty (LTFT). These full-time faculty members work from contract to contract without any promise of tenure or any illusion of being on a tenure track. In a study of Canadian universities, Rojagopal (2004) reported that limited-term full-time faculty accounted for 10.6 percent of the total number of full-time faculty. Even more significant is the study's report that the United States has twice as many faculty members (18.2%) in contract, non-tenure track positions (p. 58).

Three in four LTFTs (77.8%), compared to one in two among the part-time faculty (53.3%), wanted an academic career, and aspired to a tenure-track job. Half of LTFTs with Ph.D.s expected to get such a job in the next three years. Three in ten LTFTs with doctorates anticipated doing so at the end of their current contracts, and more than a third (39.2%) expected the renewal of their contracts. Thus two-thirds of LTFTs expected to achieve full-time status either in tenure-track positions or in continuing contracts (Rajagopal, p. 62).

The importance of these statistics is the frustration felt by LTFTs about achieving their career goals, which demonstrated the intentional lack of an extrinsic (hygiene) factor on the part of the employing institution.

Job Characteristics

Institution type, levels of administration, contract length, and the presence of a union are the job characteristics of importance to this research. Of these, the presence of a union has the highest representation in the literature. Gomez-Mejia (1984) found that the

most important correlate of a union presence in higher education was that it moderated gender differences by raising the satisfaction of women faculty members. Unionization in higher education is often seen as a community college phenomenon (Wiley, 1993), but Rhoades (1998), in a nationwide study, found that statewide systems of colleges and universities had the highest number of unionized faculty. Castro (2000) reported a link between low levels of faculty job satisfaction and an increased desire for unionization. However, Finley (1991) demonstrated that despite the fact that unionized faculty earned more than non-union faculty, the non-union faculty members still reported moderate levels of job satisfaction. Type of institution is not a researched phenomenon. Higher education researchers typically decide which level of institutional faculty members they plan to study. It is important for this research because allied health education programs exist in hospitals, community colleges, colleges, and universities. Levels of administration and contract length are also facets of employment applicable to this research, but are not significant enough for independent study.

Conceptual Framework

The researcher developed a conceptual model, based on the preceding literature, for visualizing the interrelationships of the selected variables (Figure 2). A significant portion of the framework is based on the work of Smerek and Peterson (2007). The major constructs of the model are personal characteristics, job characteristics, motivators (intrinsic factors), and hygiene factors (extrinsic factors). Overall, the conceptual model frames the research questions of this study:

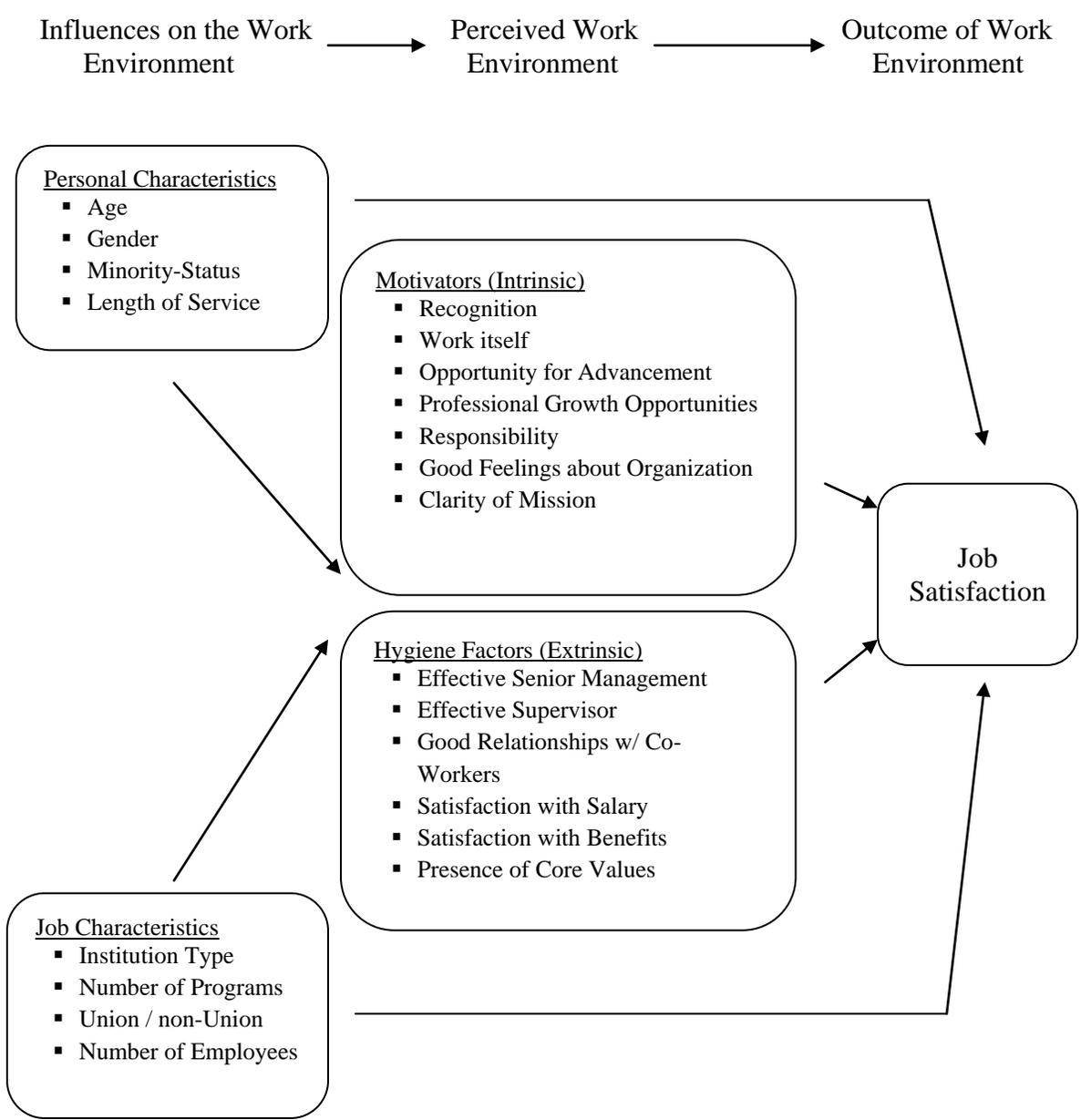
1. Do the combined scores of six specific extrinsic indicators and the combined

scores of seven specific intrinsic indicators significantly predict nuclear medicine technology, diagnostic radiologic technology, and radiation therapy faculty members' perception of their overall job satisfaction; if so, what is the magnitude of the contribution of each?

2. Do the combined scores of four personal characteristics and the combined scores of four job characteristics significantly predict nuclear medicine technology, diagnostic radiologic technology, and radiation therapy faculty members' perception of their overall job satisfaction?

3. Is there a clear distinction between the significance of extrinsic and intrinsic factors on overall job satisfaction, which would suggest Herzberg's duality theory of motivators and hygiene factors can be verified within the context of allied health education?

Figure 2 Conceptual Model of Allied Health Faculty Job Satisfaction



The model's dependent variable is job satisfaction. Job satisfaction is composed of three factors:

1. Does the job meet the person's expectations?
2. Does the job approximate the person's ideal job?
3. How satisfied is the person with their job?

The framework conceptualizes the influence of personal characteristics (gender, minority-status, age, and length of service) on the dependent variable. The model also addresses the effect of personal characteristics on the 13 perceived work environment dimensions. Next, the model examines the effect of job characteristics (Institution type, levels of administration, contract length, union status, and administrative rank) on both job satisfaction and the perceived work environment. Finally, personal and job characteristics are ignored and the 13 motivator and hygiene factors proposed by Herzberg are examined for their significance on the dependent variable of job satisfaction.

Summary

Despite the proliferation of research on job satisfaction and the heated debates in the literature, no single agreed upon theory of job satisfaction has emerged (Gruenberg, 1979; Mottaz & Potts, 1986). Researchers utilized various theoretical frameworks to determine and measure the relevant concepts and relationships associated with job satisfaction in numerous industries and disciplines. Wanous and Lawler (1972) suggested that the findings of various theoretical and operational approaches to investigating job satisfaction contradicted themselves and thus raised questions of construct validity.

Therefore, generalizations drawn from research findings on one worker population may be questionable due to the unique needs and requirements presented by each industry (Collins, 1990).

Organizational, behavioral, and higher education researchers have ignored allied health faculty. The predicted shortage of workers in the allied health fields of radiologic technology, nuclear medicine technology, and radiation therapy demands attention. Smerek and Peterson (2007) suggested that their survey instrument is a valid tool for measuring job satisfaction. Utilizing the conceptual framework diagramed in Figure 2 to determine the factors that were significant predictors of job satisfaction could provide information useful for developing recruitment and retention strategies for allied health faculty.

CHAPTER III

METHODOLOGY

The purpose of this study was to examine the predictive power of six extrinsic indicators, seven intrinsic indicators, four personal characteristics, and four job characteristics, collectively and individually, as determinants of overall job satisfaction among faculty in diagnostic radiologic technology, nuclear medicine technology, and radiation therapy educational programs. This was a survey-based, descriptive, correlational study, designed to address the following questions:

1. Do the combined scores of six specific extrinsic indicators and the combined scores of seven specific intrinsic indicators significantly predict nuclear medicine technology, diagnostic radiologic technology, and radiation therapy faculty members' perception of their overall job satisfaction; if so, what is the magnitude of the contribution of each?
2. Do the combined scores of four personal characteristics and the combined scores of four job characteristics significantly predict nuclear medicine technology, diagnostic radiologic technology, and radiation therapy faculty members' perception of their overall job satisfaction?
3. Is there a clear distinction between the significance of extrinsic and intrinsic factors on overall job satisfaction, which would suggest Herzberg's duality theory of

motivators and hygiene factors can be verified within the context of allied health education?

This chapter focuses on the design and methodology used in this study and contains the following sections: research design, participants, instrumentation, reliability and validity, data collection procedures, and data analysis.

Research Design

This study used a correlational design with two separate multiple regression analyses and two separate general linear model (GLM) analyses to examine the predictive power of two perceived work environment dimensions, extrinsic and intrinsic constructs, and two work influencing environment dimensions, personal characteristics and job characteristics, as determinants of overall job satisfaction among allied health faculty in nuclear medicine technology, radiation therapy, and diagnostic radiological technology. First, the job related demographics, gender and ethnicity, and career attributes including age – were analyzed. Next, bivariate correlations were used to determine the significance of the individual intrinsic and extrinsic variables in relation to each other. The dependent variable of overall job satisfaction was regressed upon the intrinsic and extrinsic variables in two separate analyses. In addition, the significance of the personal characteristics and job characteristics on the dependent variable of job satisfaction were measured using a separate general linear model for each.

First, a general linear model analysis was used to examine the amount of variance explained in the dependent variable of overall job satisfaction by the following four personal characteristics: age, gender, ethnicity, and length of service as well as to

determine the significance of each variable with the dependent variable. Next, a second general linear model analysis determined the amount of variance in overall job satisfaction explained by the following four job characteristics: institution type, levels of administration, union membership, and number of employees as well as to determine the significance of each variable with the dependent variable. Next, multiple regression analysis was used to examine the amount of variance in overall job satisfaction explained by the following individual extrinsic indicators: senior management, effective supervision, good relationship with co-workers, satisfaction with salary, satisfaction with benefits, and the presence of core values. Finally, a separate multiple regression analysis was used to examine the amount of variance in overall job satisfaction explained by the following individual intrinsic indicators: recognition, responsibility, the work itself, opportunities for advancement, professional growth opportunities, good feelings about the organization, and clarity of mission. The specific motivators and hygiene factors suggested by Herzberg (1969) as indicators of overall job satisfaction were measured collectively to determine the amount of variance extrinsic (hygiene factors) and intrinsic (motivating factors) explained in relation to overall job satisfaction.

Participants

At the time of this study, there were 796 educational programs in diagnostic radiologic technology (621), radiation therapy (78), and nuclear medicine technology (97) in the United States accredited by either the Joint Review Committee for Educational Programs in Radiologic Technology (JRCERT) or the Joint Commission for Educational Programs in Nuclear Medicine Technology (JRCNMT). The program

director and contact information, including email address, for each of these programs was published online by the accrediting agencies. This allowed electronic access to all 796 program directors. Current technology allowed the researcher to solicit the entire population of educators without regard to geographic, programmatic, financial, or logistical constraints. Therefore, the entire population was solicited for participation.

The total number who took the survey was 264. Of the 264 participants, 259 yielded complete surveys, resulting in a usable response rate of 32.5 percent (259 of 796). Breaking down the respondents by group revealed that of the 259 respondents, 180 were from diagnostic radiography faculty. This response represented 29.0 percent (180 of 621) of the diagnostic radiography population. Forty-six of the respondents were nuclear medicine faculty. This response represented 47.4 percent (46 of 97) of the nuclear medicine population. Finally, 33 of the respondents were radiation therapy faculty. This response represented 42.3 percent (33 of 78) of the radiation therapy population (Table 3).

TABLE 3**Frequencies and Percentiles of Respondents' Job Related Demographics**

Variables	Frequency	Percent	Overall Mean Job Satisfaction Score
Program Type			
Diagnostic Radiologic Technology	180	69.5	8.3 (SD = 1.7)
Nuclear Medicine Technology	46	17.8	8.3 (SD = 1.7)
Radiation Therapy	33	12.7	7.8 (SD = 2.1)
Type of Institution			
Hospital	75	29.0	8.3 (SD = 1.9)
Community or Technical College	102	39.4	8.3 (SD = 1.5)
Four-year College	23	8.9	8.7 (SD = 1.8)
University	49	18.9	8.2 (SD = 2.0)
Other	10	3.9	7.6 (SD = 2.1)
Type of Degree Offered			
Certificate	81	31.3	8.3 (SD = 1.9)
Associates (A.S.)	109	42.1	8.3 (SD = 1.5)
Baccalaureate (B.S.)	36	13.9	8.1 (SD = 2.3)
Certificate and Associates	8	3.1	8.1 (SD = 1.2)
Certificate and Baccalaureate	16	6.2	8.3 (SD = 1.6)
Certificate, A.S., and B.S.	4	1.5	8.3 (SD = 1.7)
Baccalaureate and Masters	3	1.2	8.3 (SD = 2.1)
Certificate, B.S., and Masters	1	0.4	8.3 (SD = 0.0)
All	1	0.4	10.0 (SD = 0.0)
Number of Programs Directly Reporting			
One	192	74.1	8.2 (SD = 1.9)
Two	32	12.4	8.1 (SD = 1.5)
Three or more	35	13.5	8.8 (SD = 1.1)
Number of Employees Directly Reporting			
One	33	12.7	7.8 (SD = 2.5)
Two	39	15.1	8.3 (SD = 1.7)
Three	48	18.5	8.1 (SD = 1.7)
Four	31	12.0	8.3 (SD = 1.8)
Five or more	108	35.7	8.5 (SD = 1.4)
Union Membership			
Yes	50	19.6	8.3 (SD = 1.6)
No	39	15.1	8.2 (SD = 1.8)
No union present	164	63.3	8.3 (SD = 1.9)
No response	6	2.3	

Females comprised 69.1 percent ($n = 179$) of the survey respondents and males 30.9 percent ($n = 80$). Respondent's ages ranged from 28 to 68 years with a mean age of 50.9 ($SD = 8.5$) years. Fifteen of the 259 respondents did not report their age. In regard to ethnicity, 91.5 percent of the respondents reported as Caucasian ($n = 237$), 4.2 percent reported as African-American ($n = 11$), and the remaining 3.9 percent of respondents were a combination of Asian, Asian-American, Black, and Hispanic or Latino ($n = 10$) (Table 4).

TABLE 4
Frequencies and Percentiles of Respondents' Gender and Ethnicity

Variables	Frequency	Percent	Overall Mean Job Satisfaction Score
Gender			
Female	179	69.1	8.2 ($SD = 1.8$)
Male	80	30.9	8.5 ($SD = 1.6$)
Ethnicity			
Caucasian	237	91.5	8.3 ($SD = 1.7$)
African-American	11	4.2	8.5 ($SD = 1.4$)
All Others	10	3.9	8.0 ($SD = 1.6$)
Not Reported	1	0.4	

In regards to the respondents career attributes, the respondents averaged 27.2 ($SD = 9.6$) years in the profession, 18.4 ($SD = 9.8$) years as an educator, 12.2 ($SD = 9.2$) years as a program director, and 15.0 ($SD = 10.0$) years at their current institution. The highest education levels of the respondents reported were Associates Degree 1.2 percent ($n = 3$), Baccalaureate Degree 5.8 percent ($n = 15$), Masters Degree 80.3 percent ($n = 208$), Doctorate of Education 5.8 percent ($n = 15$), Doctorate of Philosophy 6.2 percent ($n =$

16), and other 0.8 percent ($n = 2$). The respondents worked in a variety of institutions with a community or technical college being the most common at 39.4 percent, followed by hospitals at 29.0 percent, universities at 18.9 percent, four-year college at 8.9 percent, and other at 3.9 percent. The majority of degrees offered by the respondents' programs were Associate Degrees (43.1%), followed by Certificates (31.3%), Baccalaureate Degrees (13.9%), and the remaining 12.7 percent were comprised of a combination of all the degree types including Master Degrees. The majority of respondents (21.6%) had at least seven employees who reported directly to them and 74.1 percent of the respondents were responsible for only one program. Faculty unions were present at 29.0 percent of the respondents' institutions with 19.3 percent of the respondents reporting that they were members of the union (Table 5).

TABLE 5

Descriptive Statistics of Respondents' Career Attributes

Category	N	Minimum	Maximum	Mean	Std. Deviation
Years in the Profession	259	1	46	27.2	9.6
Years as an Educator	259	2	42	18.4	9.8
Years as a Program Director	259	0	42	12.2	9.2
Years at Current Institution	259	1	40	15.0	10.0
Age	244	28	68	50.9	8.5

Instrumentation

The Smerek and Peterson (2007) Job Satisfaction Survey was used to collect the data for this study. The Smerek and Peterson (2007) Job Satisfaction Survey consists of four sections (Appendix A): demographics, job satisfaction, extrinsic indicators, and intrinsic indicators. The demographic section contains 14 questions that relate to age, gender, ethnicity, number of years as an educator, number of years as a program director, number of years in the profession, number of years worked at current institution, number of employees, type of institution, union membership, highest education level, degree offered by program, and number of programs under direct control. The second section represents the dependent variable, overall job satisfaction, and consists of whether or not a job meets expectations, is close to the participant's ideal job, and what level of satisfaction the participant has in their job. The third section, intrinsic indicators (motivating factors), contains 43 questions in seven categories. The categories include recognition, responsibility, opportunities for advancement, professional growth opportunities, good feelings about the organization, clarity of mission, and the work itself. The fourth section, extrinsic indicators (hygiene factors), contains 57 questions in six categories. These categories include senior management, supervisor effectiveness, relationship with co-workers, satisfaction with salary, satisfaction with benefits, and the presence of core values. The questions ranged from one (*strongly disagree*) to 10 (*strongly agree*) on a 10-point Likert-type scale.

A team of administrators from the University of Michigan at Ann Arbor, led by an organization development specialist, developed the instrument in conjunction with an outside customer-satisfaction consulting firm. Smerek and Peterson (2007) first used the original survey and granted the researcher permission to utilize the instrument for this study (Appendix B).

The intrinsic, extrinsic, personal and job characteristic variables used in this study were identified and divided into groups based on the results of the Smerek and Peterson (2007) study. Smerek and Peterson (2007) first performed a data reduction (factorial analysis) using principle component analysis (PCA) with a direct oblimin rotation on the job satisfaction and the perceived work environment sections. This data reduction analysis allowed Smerek and Peterson (2007) to identify which questions in the survey belonged to each of 13 factors that approximated Herzberg's work environment dimensions. The survey items were then divided into factors based on their highest loadings and if their loading was above 0.4. Overall, 75 of the 109 questions used in the original survey converged on the 13 factors. In addition, Smerek and Peterson (2007) found that three items converged into a job satisfaction index. The three items included:

1. Imagine your ideal job (in a similar position). How well does your current position compare to that ideal job?
2. Consider all the expectations you had when you started your current job. To what extent does your current job fall short or exceed those expectations?
3. Overall, how satisfied are you with your job?

Factor loadings for these items were 0.69, 0.66, and 0.67 respectively and Cronbach's alpha for the dependent variable, overall job satisfaction, was 0.87.

In regards to the individual intrinsic factors identified by Smerek and Peterson (2007), the researchers reported Cronbach's alpha reliability coefficients of 0.82 for recognition, 0.92 for the work itself, 0.92 for opportunities for advancement, 0.89 for professional growth opportunities, 0.87 for responsibility, 0.94 for good feelings about the organization, and 0.91 for clarity of mission. Cronbach's alpha value for the individual extrinsic factors was 0.95 for effective senior management, 0.97 for supervisor effectiveness, 0.93 for good relationships with co-workers, 0.83 for satisfaction with salary, 0.84 for satisfaction with benefits, and 0.76 for presence of core values. The average reliability for all factors was 0.89.

For the respondents in this study, the coefficient alphas for the combined intrinsic scores were .88 and the combined extrinsic scores was .73. The coefficient alphas for each independent variable were recognition .83, responsibility .87, work itself .90, opportunities for advancement .80, professional growth .83, good feelings about the organization .95, clarity of mission .90, senior management .95, effective supervisor .98, good relationship with coworkers .90, satisfaction with salary .69, satisfaction with benefits .84, and presence of core values .87. The coefficient alpha for the dependent variable (overall job satisfaction) was .83. The resulting Cronbach's alphas for this study were consistent with the values reported in Smerek and Peterson's (2007) research. The favorable comparison of the results of this data with Smerek and Peterson's (2007) study establishes the consistent internal reliability of this instrument and its generalizability.

Data Collection Procedures

The data collection process consisted of three emails and took place during June 2010. Once approved by the Institutional Review Board, an initial email went out to all 796 faculty members or program directors identified as potential participants for this study. The initial email (Appendix D) went out one week prior to the email with the link to the survey, for the purpose of informing the participants of the study and requesting their participation. The email containing a link to the 114-question survey went out one week later (Appendix E). The email contained a link to the electronic survey engine, Survey Monkey, where participants completed the survey. The participants first had to read and give consent by clicking on the appropriate selection before they could proceed to the survey. In addition, three participants choosing not to give consent were not allowed to proceed to the survey and a “thank you for your time” message was displayed. Participants also were able to discontinue their participation at any time during the survey by closing the link to the survey. One week following the email with the survey link, a third email was sent to remind those who had not completed the survey to please do so (Appendix F).

Data Analysis

All statistical analyses were performed using PASW Statistics version 18.0. Intrinsic factors (motivators), extrinsic factors (hygiene factors), personal characteristics, and job characteristics were specified as the predictors (independent variables). Overall job satisfaction was specified as the criterion (dependent variable). Frequency distributions were performed on all variables to ensure that the data transferred correctly

from Survey Monkey's spread sheets to PASW and to make sure each value was entered only once. Descriptive statistics were reported for the demographic data in the form of frequencies and percents. Bivariate zero-order correlation tables were created separately for both the intrinsic and extrinsic sections of the theoretical model. Next, two separate regression analyses were performed utilizing the intrinsic and extrinsic variables to determine the unique contribution each of the sections had on the dependent variable and to determine the amount of variance in the dependent variable accounted for by each of the factors (independent variables). Finally, two separate general linear models were created for the personal characteristics and job characteristics variables. General linear models were used due to the categorical nature of the variables. See Table 6 for a summary of research questions, sources of data, and methods of analysis.

Initially, two separate multiple regression analyses were used on the intrinsic and extrinsic variables' mean values to determine whether either category significantly predicted allied health faculty members' overall job satisfaction. When it was found that the intrinsic and extrinsic factors proved to be significant, then the magnitude of the contribution of each significant predictor towards overall job satisfaction was determined by standardized regression coefficients (β). Multiple regression analysis also allowed the assessment of the relative contribution of each independent variable toward the prediction of the dependent variable while holding constant the effect of the other independent variables. The magnitude of the predictive power of any significant independent variable or variables was assessed by examining the standardized regression coefficients (β) from the regression output. Values with a magnitude close to 1.0 indicated a large contribution

toward explaining the dependent variable. Values close to 0 indicated little or no contribution toward explaining the dependent variable. In all of the regression equations, the level of significance was set at $p < .05$.

Next, two separate general linear model analyses were performed. The first utilized the personal characteristic variables and accounted for the gender and ethnicity variables as fixed factors and the age and length of service variables as covariates. The second general linear model utilized the job characteristic variables and accounted for institution type and union membership as fixed factors while number of programs and number of employees were utilized as covariates. Both analyses were performed with overall job satisfaction as the dependent variable. The degrees of freedom, F scores, significance, and partial eta squared values for the analyses were also reported.

In order for Herzberg's duality theory of motivators and hygiene factors to be verified as useful for predicting overall job satisfaction in this population, the following terms must be met:

1. The combined scores of the seven indicators in the intrinsic category must explain a significant amount of the variation in overall job satisfaction.
2. The combined scores of the six hygiene factors must have no correlation with the dependent variable of overall job satisfaction.

TABLE 6**Summary of Research Questions, Sources of Data, and Methods of Analysis**

Research Questions	Source of Data	Method of Analysis
Do the combined scores of six specific extrinsic indicators and the combined scores of seven specific intrinsic indicators significantly predict nuclear medicine technology, diagnostic radiologic technology, and radiation therapy faculty members' perception of their overall job satisfaction; if so, what is the magnitude of the contribution of each?	Intrinsic Survey Questions # 17 – 59 Extrinsic Survey Questions # 60 – 114	Descriptive statistics, bivariate zero-order correlations matrix, and forced entry multiple regression analyses.
Do the combined scores of four personal characteristics and the combined scores of four job characteristics significantly predict nuclear medicine technology, diagnostic radiologic technology, and radiation therapy faculty members' perception of their overall job satisfaction?	Job Characteristic Survey Questions # 1, 3, 4, and 6 Personal Characteristic Survey Questions # 9, 11, 12, and 13	Descriptive statistics and general linear modeling analyses.
Is there a clear distinction between the significance of extrinsic and intrinsic factors on overall job satisfaction, which would suggest Herzberg's duality theory of motivators and hygiene factors can be verified within the context of allied health education?	Intrinsic Survey Questions # 17 - 59 Extrinsic Survey Questions # 60 – 114	Forced entry multiple regression analyses from research question one.

CHAPTER IV

RESULTS

The purpose of this study was to examine the predictive value of selected intrinsic and extrinsic factors on nuclear medicine technology, diagnostic radiologic technology, and radiation therapy program directors' perception of their overall job satisfaction. This chapter discusses the results of the study in four sections: (a) relationship between the variables used in the survey instrument, (b) reliability of the study's instrument, (c) results of the statistical analysis, and (d) a summary of the results. Findings of this study may be generalized to allied health program directors who work in the United States and Puerto Rico.

Correlations

Bivariate, zero-order correlations were used to evaluate the relationship among the perceived work environment (intrinsic and extrinsic) variables used in the survey instrument without holding any other variables constant. Table 7 presents the correlations between the seven intrinsic variables including the dependent variable of overall job satisfaction. Table 8 presents the correlations between the six extrinsic variables including the dependent variable of overall job satisfaction. All tables utilize the Pearson Correlation framework because each variable was evaluated for normality of distribution. The significance of each correlation is also shown.

The correlation matrix for the intrinsic variables (Table 7) revealed positive significant relationships between all of the variables at a $p < .01$ level. The correlation matrix for the extrinsic variables (Table 8) revealed positive significant relationships between all of the variables with the exception of satisfaction with salary and satisfaction with benefits.

TABLE 7
Correlation Matrix of Intrinsic Variables

Variables	OJS	I-1	I-2	I-3	I-4	I-5	I-6	I-7
OJS	1							
I-1	.490**	1						
I-2	.555**	.616**	1					
I-3	.478**	.408**	.406**	1				
I-4	.379**	.534**	.475**	.322**	1			
I-5	.445**	.558**	.583**	.316**	.579**	1		
I-6	.517**	.554**	.535**	.586**	.528**	.529**	1	
I-7	.527**	.476**	.607**	.454**	.525**	.602**	.719**	1

Note. OJS = Overall Job Satisfaction; I-1 = Recognition; I-2 = Responsibility; I-3 = Work Itself; I-4 = Opportunities for Advancement; I-5 = Professional Growth; I-6 = Good Feelings about the Organization; I-7 = Clarity of Mission (all items scaled on 10-point Likert-type Scale with range from 1 = strongly disagree to 10 = strongly agree).

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

TABLE 8
Correlation Matrix of Extrinsic Variables

Variables							
	OJS	E-1	E-2	E-3	E-4	E-5	E-6
OJS	1						
E-1	.383**	1					
E-2	.493**	.562**	1				
E-3	.460**	.486**	.501**	1			
E-4	.104	.085	-.010	.093	1		
E-5	.274**	.220**	.110	.148*	.179	1	
E-6	.493**	.629**	.671**	.704**	.123*	.255**	1

Note. OJS = Overall Job Satisfaction; E-1 = Senior Management; E-2 = Effective Supervisor; E-3 = Good Relationship with Coworkers; E-4 = Satisfaction with Salary; E-5 = Satisfaction with Benefits; E-6 = Presence of Core Values (all items scaled on 10-point Likert-type Scale with response range from 1 = strongly disagree to 10 = strongly agree).

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

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

Multicollinearity may be a concern when there are strong significant correlations among the independent variables. In this sample, the extrinsic and intrinsic variables had several significant positive correlations with one another. Howell (2007) defined multicollinearity as a statistical condition in which the values of β are very unstable from sample to sample due to high correlations between them although R^2 may change very little. Vogt (2005) added “In multiple regression analysis, multicollinearity exists when two or more independent variables are highly correlated; this makes it difficult if not impossible to determine their separate effects on the dependent variable” (p. 198). In order to measure for the effect of collinearity, the variance inflation factors (VIF) were reported following the multiple regression analysis of the extrinsic and intrinsic variables. Vogt (2005) defined the variance inflation factor as “...1 divided by the tolerance. Therefore, low tolerances result in high VIF’s and vice versa. The lowest possible VIF is 1.0 when there is no collinearity” (p. 337). Furthermore, Vogt (2005) defined tolerance as the proportion of one independent variable not explained by other independent variables in the regression equation. Analysis of the VIF factors from the intrinsic and extrinsic variables revealed that multicollinearity is not a concern in regards to the sample data with values ranging from 1.1 to 3.1. See Table 9 for the results of the VIF calculations.

Regression Models

Multiple regression analyses (MRA) were used to answer the research questions in this study. Vogt (2005) stated that multiple regression analysis answers two main questions:

- (1) What is the effect (as measured by a regression coefficient) on a dependent variable (DV) of a one-unit change in an independent variable (IV), while controlling for the effects of all the other independent variables?
- (2) What is the total effect (as measured by the R^2) on the DV of all the IV's taken together? (p. 200)

The first research question was: Do the combined scores of six specific extrinsic indicators and the combined scores of seven specific intrinsic indicators significantly predict nuclear medicine technology, diagnostic radiologic technology, and radiation therapy faculty members' perception of their overall job satisfaction; if so, what was the magnitude of the contribution of each? This question was addressed by using forced entry multiple regression analysis. The scores for each of the six extrinsic indicators were averaged to form one mean score for each extrinsic variable. The same procedure was performed for each of the seven intrinsic indicators. The dependent variable of overall job satisfaction was then regressed upon the extrinsic and intrinsic mean scores in two separate forced regression analyses. Table 9 contains the results from the forced entry regression analyses.

In the first regression analysis utilizing only the intrinsic variables, the intrinsic variables accounted for 42.6 percent of the variance in the dependent variable of overall job satisfaction ($F = 26.76; p = .000$). In the first (intrinsic) regression model,

responsibility ($p = .001$), work itself ($p = .001$), and clarity of mission ($p = .042$) were significant predictors of the dependent variable of overall job satisfaction.

In the second regression analysis utilizing only the extrinsic variables, the extrinsic variables accounted for 34.7 percent of the variance in the dependent variable of overall job satisfaction ($F = 22.25$; $p = .000$). In the second (extrinsic) regression model, effective supervision ($p = .000$), good relationship with co-workers ($p = .003$), and satisfaction with benefits ($p = .001$) were significant predictors of the dependent variable of overall job satisfaction.

Therefore, the null hypothesis that the combined scores of six specific extrinsic indicators and the combined scores of seven specific intrinsic indicators do not significantly predict nuclear medicine technology, diagnostic radiologic technology, and radiation therapy faculty members' perception of their overall job satisfaction is rejected.

The second part of research question one was if the variables were significant predictors of overall job satisfaction in the population, then what was the magnitude of each? The magnitude of contribution for each significant predictor was determined by its associated standardized regression coefficient (Table 9). Standardized regression coefficients, also known as beta coefficients (β), are expressed in standard deviation units (i.e. z-scores) indicating what a one standard deviation increase in the independent variable would have on the standard deviation of the dependent variable while holding all other variables constant (Vogt, 2005). Table 9 presents the beta coefficients for each of the intrinsic and extrinsic variables derived from the two separate regression analyses.

The regression analysis utilizing only the intrinsic indicators revealed that, in terms of magnitude, responsibility contributed the most to overall job satisfaction ($\beta = .24$), followed by work itself ($\beta = .21$), and clarity of mission ($\beta = .16$). The regression analysis utilizing only the extrinsic indicators revealed that, in terms of magnitude, effective supervision contributed the most to overall job satisfaction ($\beta = .31$), followed by good relationship with co-workers ($\beta = .22$), and satisfaction with benefits ($\beta = .18$).

This research revealed that the extrinsic variable of effective supervision had the largest contribution to the overall job satisfaction score in regards to all of the other extrinsic significant variables. In fact, effective supervision's contribution to overall job satisfaction was nearly double the contribution of the satisfaction with benefits variable. The beta coefficient for effective supervision was .31. This means that a one standard deviation improvement in the effective supervision score will result in a .31 standard deviation improvement in the overall job satisfaction score. The effective supervision variable consisted of the following sub-factors:

1. My supervisor cares about me as a person.
2. My supervisor considers my ideas.
3. My supervisor gives me constructive feedback on my performance.
4. My supervisor recognizes me for doing good work.
5. My supervisor treats me with respect.
6. My supervisor trusts me.
7. My supervisor communicates well.
8. My supervisor creates an environment that fosters trust.

9. My supervisor deals effectively with poor performance.
10. My supervisor is an effective decision-maker.
11. My supervisor is approachable and easy to talk with.
12. My supervisor is ethical in day-to-day practices.
13. My supervisor manages people effectively.
14. Overall, I would rate my supervisor well.

The extrinsic predictor with the second largest contribution to the overall job satisfaction score was good relationship with co-workers. This variable was not significant in the Smerek and Peterson (2007) study on non-faculty employees at a large university, but had a $p = .003$ and a beta coefficient of .22 in this study. This means that a one standard deviation improvement in the total score for the good relationships with co-workers variable will result in a .22 standard deviation improvement in the overall job satisfaction score. The sub-factors that comprised the variable of good relationships with co-workers were:

1. I am consistently treated with respect by my co-workers.
2. I can count on my co-workers to help out when needed.
3. I trust my co-workers.
4. My co-workers and I work as part of a team.
5. My workgroup collaborates effectively with other workgroups or departments.
6. People care about each other in my unit or department.
7. Someone in my unit or department cares about me as a person.
8. When I joined my unit or department, I was made to feel welcome.

9. My workgroup has enough employees to handle the work.
10. The demands of my job interfere with my personal life.
11. Work is distributed fairly within my workgroup.

The extrinsic variable with the lowest magnitude in regards to its contribution to the overall job satisfaction score was satisfaction with benefits. The beta coefficient reported for satisfaction with benefits was .18. This means that a one standard deviation improvement in the factors that comprised satisfaction with benefits will result in a .18 standard deviation improvement in the overall job satisfaction score. The satisfaction with benefits variable consisted of the following four sub-factors:

1. My costs associated with the benefits plan (co-pays, deductibles, premiums) are reasonable.
2. The benefits package is a significant factor in my decision to stay at the organization.
3. The organization's benefits package has been adequately explained to me.
4. The organization's benefits package meets my needs.

This research revealed that the intrinsic variable of responsibility had the largest contribution to the overall job satisfaction score of the three significant intrinsic variables in this study. The beta coefficient for responsibility was .24. This means that a one standard deviation improvement in the responsibility score will result in a .24 standard deviation improvement in the overall job satisfaction score. The responsibility variable consisted of the following sub-factors:

1. I have a say in decisions that affect my work.

2. I have control over how I do my work.
3. My opinion counts at work.
4. I have the necessary resources, tools, or equipment to do my job.
5. The physical environment allows me to do my job.

The intrinsic variable with the second largest contribution to the dependent variable of overall job satisfaction was work itself. In this study, the work itself variable resulted in a beta coefficient of .21. This means that a one standard deviation improvement in the factors that comprised work itself will result in a .21 standard deviation improvement in the overall job satisfaction score. The work itself variable consisted of the following four sub-factors:

1. I enjoy the type of work I do.
2. I make a difference in my unit or department.
3. My job gives me a sense of accomplishment.
4. My job is interesting.

The last of the three significant intrinsic variables, ranked by the magnitude of their contribution to the dependent variable of overall job satisfaction, was clarity of mission. The beta coefficient reported for clarity of mission was .16. This means that a one standard deviation improvement in the factors that comprised clarity of mission will result in a .18 standard deviation improvement in the overall job satisfaction score. The clarity of mission variable consisted of the following six sub-factors:

1. I know what is expected of me at work.
2. I understand how my work supports the mission of my unit or department.

3. I understand how my work supports the organization's mission.
4. My supervisor has a clear view of where our department is going and how to get there.
5. The goals of my unit or department are clear to me.
6. Work is organized so that each person can see the relationship between his/her job and the goals of the organization.

In addition to the two separate multiple regressions used to evaluate the predictive value of the selected intrinsic and extrinsic indicators in this study, a general linear model analysis was performed utilizing all of the variables in the study. This analysis accounted for the categorical variables of institution type, gender, ethnicity, and union membership while treating all of the remaining variables as covariates. The purpose of this analysis was for comparison only and the results did not affect the outcome of this study. The all inclusive general linear model analysis revealed that the variables work itself ($F = 10.984, p < .01$), effective supervision ($F = 4.720, p < .05$), and relationship with co-workers ($F = 3.883, p < .05$) were the only significant variables. Effective supervision, relationship with co-workers, and the work itself were also significant in the separate regression analyses used to answer the research questions in this study.

TABLE 9

**Forced Entry Regression Analyses Summary for Predicting Overall Job Satisfaction
(N=259)**

Variable	B	Std. Error	β	Sig.	VIF
Intrinsic ($R^2 = .427$)					
Recognition	.101	.054	.127	.064	2.1
Responsibility	.261	.076	.241	.001**	2.1
Work Itself	.334	.096	.209	.001**	1.6
Opportunity for Advancement	-.015	.062	-.015	.811	1.8
Professional Growth	.043	.064	.047	.501	2.1
Good Feelings about the Organization	.086	.108	.064	.424	2.8
Clarity of Mission	.188	.092	.159	.042*	2.7
Extrinsic ($R^2 = .346$)					
Senior Management	.011	.046	.016	.817	1.8
Effective Supervisor	.242	.057	.307	.000**	2.0
Good Relationship with Co-workers	.279	.093	.215	.003**	2.0
Satisfaction with Salary	.057	.067	.044	.398	1.1
Satisfaction with Benefits	.150	.045	.175	.001**	1.1
Presence of Core Values	.079	.096	.075	.407	3.1

Dependent Variable: Overall Job Satisfaction (* $p < .05$; ** $p < .01$)

The second research question was: Do the combined scores of four personal characteristics and the combined scores of four job characteristics significantly predict nuclear medicine technology, diagnostic radiologic technology, and radiation therapy faculty members' perception of their overall job satisfaction? This question was addressed by using general linear model analyses. The dependent variable of overall job satisfaction was analyzed separately against the four personal characteristics and the four job characteristics in two separate general linear models. The personal characteristic model utilized the gender and ethnicity as fixed factors, and age and length of service as covariates. The second general linear model analysis utilized the institution type and union membership as fixed factors, and number of programs and number of employees as covariates. Table 10 contains the results from the two separate general linear model analyses.

The four personal characteristic variables accounted for only 4.2 percent of the variance in the dependent variable of overall job satisfaction. The four job characteristic variables accounted for only 3.4 percent of the variance in the dependent variable of overall job satisfaction. In the personal characteristic model, age ($p < .01$) was the only significant predictor of the dependent variable of overall job satisfaction. In the job characteristic model, number of employees ($p < .05$) was the only significant variable. The two separate general linear models revealed no significance between the combined personal characteristics and job characteristics and overall job satisfaction. Therefore, the null hypothesis that the combined scores of four personal characteristics and the combined scores of four job characteristics do not significantly predict nuclear medicine

technology, diagnostic radiologic technology, and radiation therapy faculty members' perception of their overall job satisfaction cannot be rejected.

TABLE 10

GLM Analyses Summary for Predicting Overall Job Satisfaction (N=259)

	Variable	F	Sig.	Partial Eta ²	R ²
Personal Characteristics					.042
	Age	5.506	.020*	.023	
	Gender	.827	.364	.004	
	Ethnicity	.368	.870	.008	
	Length of Service	.029	.865	.000	
Job Characteristics					.034
	Institution Type	.888	.472	.014	
	Number of Programs	.082	.775	.000	
	Union Membership	.104	.958	.001	
	Number of Employees	4.321	.039*	.017	

Dependent Variable: Overall Job Satisfaction (* $p < .05$)
Computed using alpha = .05

The third research question was: Is there a clear distinction between the significance of extrinsic and intrinsic factors on overall job satisfaction, which would suggest Herzberg's duality theory of motivators and hygiene factors can be verified within the context of allied health education? This question was addressed by evaluating the regression analyses used in research question one (Table 10). In order to verify

Herzberg's duality theory of motivators and hygiene factors, the combined scores of the seven motivating (intrinsic) factors must explain a significant amount of the variation in overall job satisfaction and the combined scores of the six hygiene (extrinsic) factors must have little to neutral correlation with the dependent variable of overall job satisfaction. In addition, the six hygiene factors must not have a negative correlation with the dependent variable of overall job satisfaction.

The first multiple regression analysis (Table 9) revealed that the intrinsic variables accounted for 42.7 percent of the total variance in the dependent variable of overall job satisfaction. In addition, the second multiple regression analysis revealed that the extrinsic indicators accounted for 34.6 percent of the total variance in the dependent variable of overall job satisfaction. The basis of Herzberg's duality theory of motivation and hygiene factors is that the hygiene (extrinsic) factors do not play a significant role in a person's overall job satisfaction. In fact, Herzberg et al. (1959) suggested that the absence of extrinsic factors did not necessarily create a negative impact on job satisfaction, but merely produced a point of no job satisfaction. In essence, Herzberg et al. (1959) was suggesting that the opposite of job satisfaction is not job dissatisfaction, but instead was simply a point of no job satisfaction without a negative effect. At the same time, Herzberg suggested that increasing the hygiene or extrinsic factors will not improve the overall job satisfaction and that only improvement in the motivating or intrinsic factors would influence the overall job satisfaction score. The results of this study suggested that not only do the extrinsic factors definitely influence overall job satisfaction in the population of allied health faculty ($R^2 = .35$), but also that three of the

six extrinsic indicators had a significant correlation with overall job satisfaction. The three significant extrinsic variables were: effective supervisor ($p = .000$), good relationship with co-workers ($p = .003$), and satisfaction with benefits ($p = .001$). Therefore, the survey data in this study did not support Herzberg et al.'s (1959) duality theory of job satisfaction and the null hypothesis was not rejected. Herzberg's duality theory of job satisfaction is not a viable tool for measuring overall job satisfaction in diagnostic radiologic technology, nuclear medicine technology, and radiation therapy faculty.

Summary

The purpose of this study was to examine the predictive value of selected intrinsic and extrinsic factors on nuclear medicine technology, diagnostic radiologic technology, and radiation therapy program director's perception of their overall job satisfaction. The survey instrument was completed by 259 of the 796 program directors solicited, resulting in a sample size of 32.5 percent. Analysis of the demographic data revealed that the sample was comprised of predominantly Caucasians (91.5%) and females (69.1%) with a mean age of 50.9 (SD = 8.5) years and 27.2 (SD = 9.6) years of experience in their respective professions. Research question one explored any significant relationship between the perceived work environments and overall job satisfaction via selected intrinsic and extrinsic motivators. Using separate forced entry multiple regression analyses, the six extrinsic variables accounted for 34.6 percent of the total variance in the dependent variable of overall job satisfaction and the seven intrinsic variables explained 42.7 percent of the variability in the dependent variable of overall job satisfaction. Both

intrinsic and extrinsic variables were significant indicators of the dependent variable at the .001 level. The combined personal characteristic model and the combined job characteristic model defined in research question two each failed to explain a significant amount of the variance in the dependent variable of overall satisfaction. Of the personal characteristics included in the instrument, age was the only one to have a significant correlation to the dependent variable. Of the job characteristics included in the instrument, number of employees was the only variable to have a significant correlation to the dependent variable of overall job satisfaction. The third research question failed to support Herzberg's duality theory of job satisfaction because both the intrinsic and extrinsic variables had a significant positive relationship with the dependent variable of overall job satisfaction and Herzberg's theory stated that the extrinsic factors should not have a significant correlation with overall job satisfaction.

CHAPTER V

DISCUSSION

Healthcare is the largest industry in the United States with an estimated 14 million workers (United States Bureau of Labor and Statistics, 2009). Allied health professionals account for 60 percent of the entire health care work force with workers involved in more than 200 distinct fields of practice. The Bureau estimates that healthcare will generate three million new jobs between 2006 and 2016, far more than any other industry. Despite the recent economic downturn and revamping of health care reimbursement laws, change in healthcare will continue at an accelerated pace. These changes will present a need for more training and higher-level training.

Preparing the future healthcare workforce requires allied health educators who are motivated and capable of instilling only the best possible practices in their students. These educators may not achieve the high level of training necessary for producing quality graduates if they are dissatisfied with their jobs. Therefore, identifying conditions in the work setting that contribute to job dissatisfaction is imperative and calls for a collaborative effort by administrators, researchers, and health care planners (Sowell & Alexander, 1989). Both job satisfiers and causes of dissatisfaction must be identified so that strategies can be developed to counteract the problems of recruitment, retention, motivation, and overall job satisfaction (Herzberg, 1982; Rozier, Gildeson, & Hamilton, 1991).

The purpose of this study was to examine the predictive power of selected extrinsic and intrinsic indicators as determinants of overall job satisfaction among faculty in diagnostic radiologic technology, nuclear medicine technology, and radiation therapy educational programs. This was a survey-based, descriptive, correlational study, which addressed the following questions:

1. Did the combined scores of six specific extrinsic indicators and the combined scores of seven specific intrinsic indicators significantly predict nuclear medicine technology, diagnostic radiologic technology, and radiation therapy faculty members' perception of their overall job satisfaction; if so, what was the magnitude of the contribution of each?

2. Did the combined scores of four personal characteristics and the combined scores of four job characteristics significantly predict nuclear medicine technology, diagnostic radiologic technology, and radiation therapy faculty members' perception of their overall job satisfaction?

3. Is there a clear distinction between the significance of extrinsic and intrinsic factors on overall job satisfaction, which would suggest Herzberg's duality theory of motivators and hygiene factors can be verified within the context of allied health education?

This chapter discusses the results of the study and contains the following six sections: findings, limitations, delimitations, implications for practice, implications for research, and conclusions.

Findings

Preliminary Analyses

This study produced some noteworthy findings, particularly regarding the variables of age, gender, ethnicity, responsibility, work itself, effective supervisor, good relationship with co-workers, and satisfaction with benefits. Analysis of the demographic data revealed that a program director in nuclear medicine, diagnostic radiography, or radiation therapy is two times more likely to be female than male, and nine times more likely to be Caucasian than any other ethnicity. Although ethnicity and sex did not significantly predict overall job satisfaction in this study, the lack of diversity may be a concern. In particular, community colleges, which comprised 39.4 percent of the participants in this study, often have larger numbers of minority students than their four-year counterparts yet lack a proportional minority faculty representation (Isaac & Boyer, 2007). Isaac and Boyer (2007) stressed that a diverse faculty is needed to provide role models, a support system, advisors, and advocates for minority students as well as to expose majority students to new ideas. The topic of racial diversity in allied health faculty, although not within the scope of this study, may be worthy of further research.

Analysis of the personal and job characteristics, which comprised the “Influences on the Work Environment” portion of the conceptual model, revealed that age and number of employees were the only significant variable in regards to the dependent variable of overall job satisfaction. The average age of the survey respondents was 50.9 (SD = 8.5) years, and the respondents averaged 27.2 (SD = 9.6) years of experience in the profession. Gahn and Twombly (2001) demonstrated that the vast majority of health

faculty came from positions in hospitals or the healthcare industry at mid to late stages in their careers. In addition, Cockburn (1998) demonstrated that age has a U-shaped effect on job satisfaction with younger and older workers presenting higher levels of job satisfaction and mid-career workers reporting lower levels. The results of this study were consistent with Cockburn's (1998) research in that the respondents were mostly in the last trimester of their careers and demonstrated high overall job satisfaction scores. The fact that both of the personal and job characteristic general linear models failed to explain a significant amount of variation in the dependent variable of overall job satisfaction, is important to the outcome of this research because it establishes the variables in the "perceived work environment" category of the conceptual model as the primary contributors to overall job satisfaction. This signifies that, unlike personal and job characteristics, the primary contributors to allied health faculty members' perception of their overall job satisfaction are malleable factors for concerned administrators within an institution or organization.

Analysis of the variables comprising the "perceived work environment" section of the conceptual model further established the value of the survey instrument as a predictor of job satisfaction. The "perceived work environment" section of the theoretical model was comprised of the six intrinsic and seven extrinsic variables. The regression analysis utilizing the intrinsic variables explained 43 percent of the variance on overall job satisfaction. In addition, the regression analysis utilizing the extrinsic indicators explained 35 percent of the variance in overall job satisfaction. These results are consistent with Smerek and Peterson's (2007) result of an $R^2 = .46$ in the population of

non-faculty employees at a large university. In addition, the intrinsic variables of responsibility and work itself stood out with beta (β) values of .24 and .21 respectively. Smerek and Peterson (2007) reported work itself as the most influential variable with a $\beta = .35$. Surprisingly, in the second regression analysis utilizing the extrinsic variables, the extrinsic variable of effective supervision proved to be the most powerful predictor of overall job satisfaction in this study with a $\beta = .31$. This is an important finding because effective supervision is arguably one of the easiest extrinsic variables to manipulate in the workplace.

Research Question One

Do the combined scores of six specific extrinsic indicators and the combined scores of seven specific intrinsic indicators significantly predict nuclear medicine technology, diagnostic radiologic technology, and radiation therapy faculty members' perception of their overall job satisfaction; if so, what was the magnitude of the contribution of each? The findings from this study indicated that there is a significant correlation between three of the six combined extrinsic indicators of overall job satisfaction. The study also indicated that there is a significant correlation between three of the seven intrinsic indicators and overall job satisfaction. In two separate regression analyses, the intrinsic variables accounted for 43 percent of the variance in overall job satisfaction, and the extrinsic variables accounted for 35 percent of the variance in overall job satisfaction. Therefore, the researcher accepted the above hypothesis and rejected the null hypothesis that no significant relationship between the selected independent variables and the dependent variable of overall job satisfaction existed.

In regards to the individual variables, six of the 13 intrinsic and extrinsic variables had a significant correlation with the dependent variable of overall job satisfaction in the two separate regression analyses. In regards to the extrinsic variables, the magnitude of each of the significant variables ranked in order of their contribution to the overall job satisfaction score were effective supervisor ($\beta = .31$), good relationship with co-workers ($\beta = .22$), and satisfaction with benefits ($\beta = .18$). In regards to the intrinsic variables, the magnitude of each of the significant variables ranked in order of their contribution to the overall job satisfaction score were responsibility ($\beta = .24$), work itself ($\beta = .21$), and clarity of mission ($\beta = .16$). The beta coefficient values represent what percentage increase a one standard deviation increase in the independent variable would have on the standard deviation of the dependent variable of overall job satisfaction score. For example, a one standard deviation increase in the independent variable effective supervision would result in a .31 standard deviation increase in the overall job satisfaction score.

These results are important for several reasons. First, the results of this study provide allied health administrators with the knowledge of which indicators contribute the most to the overall job satisfaction of their faculty members or program directors, thus possibly reducing the waste of time, effort, and expenses on efforts to improve job satisfaction. Second, the results of this study demonstrated that effective supervision has the largest contribution to overall job satisfaction, nearly double that of satisfaction with benefits and clarity of mission, and should be the primary focus of administrators. Third, the results of this study can provide a roadmap to improving overall job satisfaction by

allowing administrators to focus on the six significant variables. Finally, the significance of the extrinsic variables correlating with overall job satisfaction demonstrated the importance of providing a positive work environment, particularly concerning good relationships with co-workers, in which the employees feel trusted and are reimbursed appropriately for their efforts. In addition, the results of this study may motivate future researchers to utilize the Smerek and Peterson (2007) survey for the study of job satisfaction in other populations.

Responsibility and effective supervision presented as the variables with the highest magnitude contribution to the overall job satisfaction score in their respective regression analyses. Smerek and Peterson (2007) also demonstrated that responsibility and effective supervision were significant indicators of job satisfaction in their study of non-faculty employees at a large university. The behavioral science approach, which originated in the 1950's, stressed the importance of participation, quality of work life, team building, job enrichment, responsibility, and self-motivation (Donnelly et al., 2000). McGregor's (1960) Theory Y, also stressed the value of responsibility, and suggested that organizations not providing workers with a stake in their jobs would reduce self-direction and self-control in achieving organizational and departmental objectives.

The sub-factors that comprise the variables responsibility and effective supervision may be the easiest to manipulate in relation to actual practice in the workplace through the utilization of approaches such as participative leadership. Shipper (2009) stressed the importance of participative management with roots as far back as the Michigan studies from the 1950's and 1960's. However, it is noteworthy that Locke and

Schweiger (1978), utilizing the Michigan and Ohio State research, reported that only 60 percent of the studies supported participative leadership over autocratic, 30 percent revealed no significant difference, and 9 percent suggested that participative leadership was inferior to autocratic. The significance of these variables in relation to overall job satisfaction demonstrates a need for effective leadership, both in human resource and capital management. The fact that responsibility is an intrinsic indicator and effective supervision is an extrinsic indicator, as defined by Smerek and Peterson (2007), demonstrated the importance of both aspects of the perceived work environment. It also reduced Herzberg's (1982) argument that intrinsic motivators are more important than extrinsic (hygiene) factors in overall job satisfaction. Moreover, it should lead organizational leaders to conclude that improvement is important in both management and workers.

Satisfaction with benefits and clarity of mission were the significant indicators of overall job satisfaction in this study with the lowest contribution to the overall job satisfaction score with contributions of 18 percent and 16 percent in their separate regression analyses respectively. Smerek and Peterson (2007) did not find satisfaction with benefits to be a significant predictor of overall job satisfaction in their study of non-faculty employees at a large university, but they did find a significant relationship between clarity of mission and overall job satisfaction. It is possible that the current economic downturn has increased the importance of the satisfaction with benefits variable in comparison to when Smerek and Peterson (2007) performed their research. In addition, it is likely that Herzberg's (1959) research was performed in a much more

prosperous economic period. Another possible explanation for the significance of the satisfaction with benefits variable is the average age of this population. At 50.9 (SD = 8.5) years, this group may have been more focused on benefits than the participants in the other studies. From a practical standpoint, decisions affecting the benefits offered at hospitals, colleges, and universities are not likely to be within the purview of administrators at the department or unit level, but can be moderated through improvements in the other significant indicators.

Clarity of mission may be influenced strongly by organizational climate. Ayers (2005) suggested that community colleges, which comprised the majority of participants' institution type in this study (39.4%), are postmodern organizations that are increasingly heterogeneous with organizational climates that are likely a property of subsystems within the organizations. An effective leader in these environments must understand the importance of communicating not only the departmental goals, but also how they support and complement the larger mission of the organization.

Research Question Two

Do the combined scores of four personal characteristics and the combined scores of four job characteristics significantly predict nuclear medicine technology, diagnostic radiologic technology, and radiation therapy faculty members' perception of their overall job satisfaction? The findings from this study demonstrated that there is no significant correlation between the combined scores of the four personal characteristics and the dependent variable of overall job satisfaction. In addition, the results of this study demonstrated that there is no significant correlation between the combined scores of the

four job characteristics and the dependent variable of overall job satisfaction. Therefore, the researcher cannot reject the null hypothesis that the combined scores of the four personal characteristics and the combined scores of the four job characteristics do not significantly predict nuclear medicine technology, diagnostic radiologic technology, and radiation therapy faculty members' perception of their overall job satisfaction.

Two noteworthy findings resulted from this research question. The first is that out of all eight personal and job related characteristics age and number of employees were the only variables with any significant relationship to the dependent variable of overall job satisfaction. As discussed earlier, age is a proven indicator of job satisfaction, and it is not a surprise that it was significant in this study, particularly because the average age of the study participants was 50.9 (SD = 8.5) years. The second, and most noteworthy finding, is that personal factors and job characteristics may be removed from the equation of overall job satisfaction in this population and administrators can focus their efforts to improve job satisfaction on the six significant intrinsic and extrinsic variables, which are variables that can be effectively manipulated in the workplace.

Research Question Three

Is there a clear distinction between the significance of extrinsic and intrinsic factors on overall job satisfaction, which would suggest Herzberg's duality theory of motivators and hygiene factors can be verified within the context of allied health education? In order to verify that Herzberg's theory is applicable to this allied health faculty population required that the intrinsic variables have a significant relationship with the dependent variable of overall job satisfaction and at the same time the extrinsic

variables must have a small to non-existent relationship with the dependent variable. The two regression analyses used to answer research question one confirmed that both the combined intrinsic and combined extrinsic variables had a positive significant relationship with the dependent variable of overall job satisfaction. Therefore, the researcher cannot reject the null hypothesis that there is no clear distinction between the significance of extrinsic and intrinsic factors on overall job satisfaction.

Herzberg (1959, 1966, 1968, 1982) continually insisted that extrinsic factors in relation to job satisfaction were merely hygiene factors. This meant that the existence of these factors, such as effective supervision and benefits, would not improve job satisfaction, but would only maintain job satisfaction at a neutral level. Herzberg et al. (1959) proposed that the opposite of job satisfaction was not dissatisfaction, but instead was a zero-point in which neither job satisfaction nor job dissatisfaction existed. Therefore, he proposed that to improve job satisfaction the only factors that mattered were the motivating or intrinsic factors. The data from this study not only contradict Herzberg's theory by demonstrating that the extrinsic factors contributed significantly to overall job satisfaction, but they did so impressively, by explaining 35 percent of the variance. In addition, the significant factor with the highest contribution to overall job satisfaction was effective supervision, which is an extrinsic variable. The results of research question three are consistent with the findings of Smerek and Peterson's (2007) study in that they also found significance in the extrinsic or hygiene factors in non-faculty employees at a large university and failed to confirm Herzberg's theory.

What the results of research question three mean to the study of job satisfaction is that extrinsic factors are equally if not more important than intrinsic factors in their contribution to job satisfaction. In fact, I would suggest that we no longer use the term hygiene factor concerning job satisfaction. The term hygiene connotes the idea that these factors simply must be present in ample quantity in order to satisfy employees, which may have been true in Herzberg's era where benefits, such as pensions and full-range insurance coverage, were available in almost all professions. Today, benefits vary widely from institution to institution and are far from guaranteed. In addition, the term hygiene creates the illusion of a positive or healthy relationship, which Herzberg himself said is not always the case. Finally, referring to variables, such as effective supervision, as hygiene allows managers who may have risen to their level of incompetence to excuse their poor leadership by attributing negative outcomes to extrinsic factors. I recommend that we delete the term hygiene from the job satisfaction vernacular and instead refer to this group of variables only as extrinsic indicators. Herzberg's theory is impressive in its simplicity and appealed to this researcher due to its common sense logic, but after analyzing the data in this study, it is obvious that job satisfaction in post-modern organizations, such as hospitals and universities, is a far more complex phenomenon than Herzberg's theory could account for.

Limitations

Several limitations existed for this study. The first limitation was the delivery format of the survey instrument. Despite the fact that the population being studied work in professions with high technological requirements, it does not guarantee that they have

a practical understanding of the internet or email, consistently check their email, or respond to electronic survey requests. There is also the possibility that a number of the soliciting emails were filtered out by the intended subjects' email software. Despite this limitation, the response rate of 32.9 percent was more than adequate for analysis.

A second limitation of the study existed in that the target population was different from the original population the survey instrument was developed to study. Smerek and Peterson (2007) initially used the instrument to study non-academic employees in business operations at a large, public university. The limitation based on the type of population studied was moderated by changes to the conceptual model and analysis of the results obtained. In Smerek and Peterson's (2007) original conceptual model the job characteristics portion of the model was broken down into the four areas in which the population worked. The four sections were facilities and operations, human resources, finance, and administrative IT. In order to make the model appropriate for the allied health population in this study, the researcher modified the four job characteristics to institution type, number of programs directly reporting, union status, and number of employees directly reporting. These changes did not affect the survey instrument because they were added as additional questions.

Delimitations

A delimitation of the study was the purposive defining of the population. The United States Bureau of Labor and Statistics (2009) stated that allied health includes more than 200 fields. For this study, the researcher selected three professions of personal and professional interest: diagnostic radiologic technology, nuclear medicine technology,

and radiation therapy. This may decrease the generalizability of the results to other fields in allied health.

Another delimiting factor existed in the fact that some educational programs in diagnostic radiologic technology, radiation therapy, and nuclear medicine technology operate outside of the Joint Review Committee's oversight using the six regional accrediting bodies of higher education in the United States as a means of qualifying their graduates for national certification examinations. These programs were excluded from the study because they are not required to meet the same rigorous standards as the included groups, they are not peer reviewed, and were therefore not deemed worthy of inclusion in this study.

Implications for Practice

The results from this research can provide insight and inform the practice of administrators and program directors in allied health educational programs concerning the improvement or understanding of the key indicators of overall job satisfaction, improving working conditions for faculty members, and reducing attrition in program staff. For example, it is important to note that personal and job characteristics, which most likely are not malleable factors, are not significant predictors of overall job satisfaction. It is however helpful to note that age was a significant indicator of job satisfaction. The significance of this finding, while being noteworthy, is likely not a valuable tool for improving job satisfaction. I recommend that administrators who are concerned with improving the overall job satisfaction of their department or programs develop a thorough understanding of the metrics used in this study. Many of the

indicators found to be significant in this study relate directly to effective supervision and management. At a minimum, reading and thinking through the survey instrument itself would provide a benefit by increasing awareness of key indicators of job satisfaction.

Extrinsic Indicators

Findings from the present study revealed that the extrinsic indicator of effective supervision was the largest contributor to the overall job satisfaction score. This was an unsuspected finding considering that Herzberg et al. (1959) suggested that supervision, in relation to job satisfaction, was overrated. Allied health educators, and educators in higher education, arguably enjoy a high amount of task and work autonomy. Therefore, it would seem contradictory that effective supervision would have such a significant impact. Analysis of the scores comprising the effective supervision category revealed that the study participants viewed their supervisor in a positive light with the exception of their ability to deal with poor performing employees. The scores demonstrate that the study participants attribute a large proportion of their job satisfaction to the performance of their supervisors. One possible explanation may be an increased need for recognition due to their increased work and task autonomy. It is possible that this population is not confident that their contributions are fully understood or appreciated by the organization, thus increasing the importance of the supervisor in the job satisfaction equation. The lower score on dealing with poor performance reflects their desire to have a supervisor who addresses issues in the workplace effectively. These programs are outcome based, meaning that each graduate must pass a certification examination in order to work in their

selected field. Therefore, a poor performing co-worker directly affects the entire program and requires timely and effective intervention.

Mantel (1990) demonstrated that nursing motivation, job commitment, job performance, and overall job satisfaction were dependent on managerial style and performance expectations. The nurses in the Mantel (1990) study provided with the highest amount of structure, counseling, feedback, and evaluation in their jobs demonstrated the highest levels of job satisfaction. The questions in this study that related to effective supervision focused more on the personal aspect of supervision. Therefore, based on the results of this study, in order to improve overall job satisfaction a supervisor should focus on improving trust between themselves and their employees. They should communicate effectively, particularly in regards to decision-making and feedback. Feedback should be constructive and delivered in a respectful manner. The supervisor should create an environment of collaboration and deal effectively and quickly with employees who perform poorly. Finally, an effective supervisor should acknowledge employees for their hard work and contributions through verbal and written methods.

The extrinsic indicator with the second highest contribution to the overall job satisfaction score was good relationship with co-workers. The importance of having a supportive environment goes beyond simply putting people together and expecting collegiality, concern, and respect. Vroom (1964) established the importance of co-worker support on overall job satisfaction. McCloskey (1990) suggested that co-worker support canceled some of the negative effects created by a lack of perceived intrinsic rewards in a population of nurses. The good news for administrators is that a number of the

requirements for improving effective supervision should also improve relationships with co-workers. The implications for practice are that administrators should select employees who demonstrate consideration and stress the importance of mentoring. In addition, administrators of large departments should develop projects that include as many employees as possible, increase the amount of engagement that occurs between employees through physical layout of workflows and workspace, and constantly monitor work assignments to ensure equitable distribution. The literature on team building is vast, and an interested administrator should have no difficulty in finding advice on the subject.

The final significant extrinsic indicator, and the one with the smallest contribution to the score of overall job satisfaction, was satisfaction with benefits. This is a difficult indicator for department level administrators to manipulate because these decisions typically come from the highest levels of the organization or in the case of public organizations, outside bodies or legislatures. It is likely that this sample group is more sensitive to their job benefits due to their average age. Workers closer to retirement age should be more sensitive to health care and retirement benefits. A concerned administrator can possibly moderate the effect of low benefit satisfaction on overall job satisfaction by improving the other indicators noted in this study. In addition, it may be possible to compare benefits with other organizations and point out any favorable differences. Union membership, if present, is another possible route for trying to improve the compensation package at the institution or organization through collective bargaining.

Intrinsic Indicators

The results of research question one indicated that the combined scores of the intrinsic variables significantly predicted overall job satisfaction among allied health faculty in diagnostic radiologic technology, nuclear medicine technology, and radiation therapy. This finding indicated that overall job satisfaction could be enhanced by designing allied health faculty positions that promote responsibility, interesting work, and clear job goals. The findings regarding the significance of the combined intrinsic variables are consistent with other research on job satisfaction. Centers and Bugental (1966), Gruenberg (1979), Mottaz (1985), and Vroom (1964) demonstrated that a positive linear relationship existed between a combined intrinsic score and overall job satisfaction.

Individually, the intrinsic indicator with the largest contribution to the overall job satisfaction score was responsibility. An administrator concerned with improving overall job satisfaction through the improvement of this indicator should focus on designing a work environment that provides input from the faculty on decisions that affect their work, autonomy over assigned work areas, and the physical tools and support needed to work effectively.

The significant intrinsic indicator with the second largest contribution to the overall job satisfaction score identified by the results of this study was work itself. The implication for practice presented by this result is that administrators must identify ways to make the work important to the individual. I suggest that class size be maintained at a level that will allow the faculty to interact with each student in person and frequently. If

possible, the faculty should be allowed to work with the students in a clinical environment where they can demonstrate the knowledge put forth in the classroom. This would allow the faculty members to maintain their clinical skills and may benefit them personally and professionally through interactions with patients and students.

Ceremonies, such as orientation parties and graduations, must be celebrated and managed in a manner that identifies the importance of each faculty members' role in the program. Finally, an administrator utilizing this indicator must maintain relationships close enough to the faculty and staff to identify when their interests are waning and find ways to motivate them or be willing to let them go.

The final significant intrinsic indicator identified in this study was clarity of mission. It is likely that clarity of mission is becoming more important to allied health faculty due to the decentralization of campuses in the post-modern era. The practical implications are that administrators need to set clear, attainable goals and communicate how those goals support the department and the institution. Within the department there should be a thorough understanding of what each faculty and staff member is responsible for and why. Communication is the key to improving clarity of mission satisfaction scores.

Implications for Research

The results of this study have several implications for research on allied health faculty, job satisfaction in general, and motivation in the workplace. The significant correlations between the variables in this study and overall job satisfaction contribute to the body of research on job satisfaction. It builds on over 100 years of management and

job environment research. Moreover, it establishes research in the area of allied health research, specifically in regards to faculty who work in diagnostic radiologic technology, nuclear medicine technology, and radiation therapy.

The results of this study add to the generalizability of the survey instrument created and first used by Smerek and Peterson (2007) and demonstrated its value in populations other than non-academic university employees. The reliability coefficients also contributed to the validity and reliability of the original instrument. In addition, the lack of support for Herzberg's (1959) Motivation-Hygiene Theory in this study is consistent with Smerek and Peterson's (2007) results. Finally, this study demonstrated that personal and job characteristics, with the exception of age, are not significant contributors to overall job satisfaction.

Herzberg et al.'s (1959) publication, *The Motivation to Work*, produced a strong response, both for and against, the idea that money and other extrinsic indicators are not the primary motivators in job satisfaction. The publication had a profound effect on the fields of job satisfaction and motivational research and to this day researchers, such as me, are struggling with the value of the theory in a postmodern, post-industrial work force. Researchers, such as Smerek and Peterson (2007) and Byrne (2006), who failed to find support for Herzberg's theory, make note of the flaws in the original research the theory was based on. Herzberg et al. (1959) interviewed 203 accountants during the post WWII era in the United States and were only interested in their polarizing experiences. This critical-incidence method has proved to be virtually impossible to reproduce, yet the theory derived from it appears to have great appeal to a number of

researchers. This research, while not supporting Herzberg's theory, adds to the number of studies that have failed to verify the neutral impact of hygiene (extrinsic) factors on job satisfaction.

Another finding of this study with implications for research is the lack of correlation between the personal and job characteristics and overall job satisfaction. A significant number of studies have focused on the effects of ethnicity and gender on the experiences and level of job satisfaction of faculty members, both in the community college (Bellas, 1997; Corbin, 2001; Gahn & Twombly, 2001; Gomez-Mejia & Balkin, 1984; Hardy & Laanan, 2006; Niemann & Dovidio, 2005; Okpara et al., 2005; Opp & Gosetti, 2002a; Townsend, 1998) and in the college and university (Bellas, 1997; Bronstein, 1993; Bronstein & Farnsworth, 1998; Dey, 1994; Hagedorn, 1996; Johnsrud, 1993; Johnsrud, 2002; Laden & Hagedorn, 2000; McElrath, 1992; Olsen, Maple, & Stage, 1995; Peluchette, 1993; Perna, 2001; Thompson & Dey, 1998; Turner, 2002; Witt & Lovrich, 1988). The large ratio of Caucasian ($n = 237$ or 91.5%) to other ethnicities ($n = 21$ or 8.1%) in the results of this study prevented any significant predictions to be reached based on ethnicity. However, comparing the overall job satisfaction between males and females in this study revealed no differences. In fact, 92.7 percent of females and 92.6 percent of males reported that they were satisfied with their current jobs. As mentioned earlier, age was a significant predictor of overall job satisfaction in this study. Therefore, future researchers may want to investigate this phenomenon further.

Conclusions

According to the United States Bureau of Labor and Statistics (2009), allied health workers account for 60 percent of the entire domestic health care workforce. This is approximately 8.4 million workers in over 200 distinct fields of practice. Keeping pace with this growing workforce; advances in technology; and the fear of an unknown future will require educators who are motivated to teach and enjoy their jobs (Benson & Dundis, 2003). These educators may not achieve the high level of training necessary for producing quality graduates if they are dissatisfied with their jobs. Therefore, identifying conditions in the work setting that contribute to job dissatisfaction is imperative and calls for a collaborative effort by administrators, researchers, and health care planners (Sowell & Alexander, 1989). Both job satisfiers and causes of dissatisfaction must be identified so that strategies can be developed to counteract the problems of recruitment, retention, motivation, and overall job satisfaction (Herzberg, 1982; Rozier, Gildeson, & Hamilton, 1991).

The most noteworthy finding of this study was that overall, diagnostic radiologic technology, nuclear medicine technology, and radiation therapy program directors and faculty members appear to be satisfied with their jobs. The overall job satisfaction for the aggregate of all study participants was 8.3 (SD = 1.7) on a Likert-type scale of one to ten with one being strongly dissatisfied and ten being strongly satisfied. The score of 8.3 (SD = 1.7) is a strong indication of overall job satisfaction yet still leaves room for improvement. Administrators, department managers, and senior faculty should focus on

the significant findings from this study in order to improve overall job satisfaction for their employees.

The findings from this study indicated that the intrinsic indicators of responsibility, work itself, and clarity of mission; as well as the extrinsic indicators of effective supervision, good relationship with co-workers, and satisfaction with benefits could serve as predictors of overall job satisfaction in diagnostic radiologic technology, nuclear medicine technology, and radiation therapy faculty. In addition, the findings from this study suggested that personal and job characteristics, with the exception of age, do not significantly predict overall job satisfaction in this population. Furthermore, the results of this study do not support the motivation-hygiene theory put forth by Herzberg et al. (1959). Finally, the findings of this study support the use of the Smerek and Peterson (2007) job satisfaction survey for evaluating allied health faculty members' perception of their overall job satisfaction.

The literature on job satisfaction and worker motivation is immense, with a history dating back to Taylorism in the industrial revolution, but the application of over 100 years of research has of yet not been focused on this facet of allied health faculty. The instrument used in this study should be a valuable tool for administrators interested in improving the work lives of their faculty and for providing a valid basis of evaluation for future researchers. More research is needed to further understand the indicators driving job satisfaction within the fields of allied health. Future researchers should utilize this instrument in measuring job satisfaction in other populations.

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APPENDIX A
ALLIED HEALTH JOB SATISFACTION SURVEY

DEMOGRAPHICS

- Question 1: At what type of institution do you work?
- Question 2: What degree type does your program offer?
- Question 3: How many programs report to you directly?
- Question 4: How many employees report directly to you?
- Question 5: Is there a union present at your institution?
- Question 6: Are you a member of the union?
- Question 7: How many years have you been in the profession?
- Question 8: How many years have you been an educator?
- Question 9: How many years have you been a program director?
- Question 10: How many years have you been at your current institution?
- Question 11: What is your gender?
- Question 12: What is your race?
- Question 13: What is your age?
- Question 14: What is your highest level of education?

JOB SATISFACTION

- Question 15: Consider all the expectations you had when you started your current job.
To what extent does your current job fall short of those expectations?
- Question 16: Consider all the expectations you had when you started your current job.
To what extent does your current job exceed those expectations?
- Question 17: Imagine your ideal job (in a similar position). How well does your current position compare to that ideal job?
- Question 18: Overall, how satisfied are you with your job?

MOTIVATORS (INTRINSIC INDICATORS)***Recognition***

Question 19: Expressions of thanks and appreciation are common in my unit/department.

Question 20: I get appropriate recognition when I have done something extraordinary.

Question 21: In the last 7 days I have received recognition or praise for doing good work.

Question 22: My contributions are valued by members of the organization community outside
of my unit/department.

Question 23: My customers recognize my good work.

Responsibility

Question 24: I have a say in decisions that affect my work.

Question 25: I have control over how I do my work.

Question 26: My opinion counts at work.

Question 27: I have the necessary resources, tools, or equipment to do my job.

Question 28: The physical environment allows me to do my job.

Work Itself

Question 29: I enjoy the type of work I do.

Question 30: I make a difference in my unit/department.

Question 31: My job gives me a sense of accomplishment.

Question 32: My job is interesting.

Opportunities for Advancement

Question 33: I know what is required of me to advance within the organization.

Question 34: Information about job vacancies within the organization is readily available.

Question 35: Internal candidates receive fair consideration for open positions.

Question 36: Opportunities for advancement or promotion exist within the organization.

Professional Growth Opportunities

Question 37: I have had opportunities at work to learn and grow in the past year.

Question 38: I have received the necessary training to do my job well.

Question 39: My unit/department offers the training or education that I need to grow in my job.

Question 40: Someone has talked to me about my progress in the past year.

Question 41: There is someone at work who encourages my development.

Good Feelings about Organization

Question 42: I am proud to work for the organization.

Question 43: I care about the future of the organization.

Question 44: I enjoy discussing the organization with people who do not work here.

Question 45: I feel a strong sense of belonging to the organization.

Question 46: I have a strong commitment to the organization.

Question 47: My contributions are valued by members of the organization community outside
of my unit/department.

Question 48: I am proud to work for my unit/department.

Question 49: I care about the future of my unit/department.

Question 50: I enjoy discussing my unit/department with people who do not work here.

Question 51: I feel a strong sense of belonging to my unit/department.

Question 52: I have a strong commitment to my unit/department.

Question 53: I think of ways to improve how we do things in my unit/department.

Question 54: I would recommend my unit/department to someone who is looking for a good
place to work.

Clarity of Mission

Question 55: I know what is expected of me at work.

Question 56: I understand how my work supports the mission of my unit/department.

Question 57: I understand how my work supports the mission of my unit/department.

Question 58: I understand how my work supports the organization's mission of research, teaching and service.

Question 59: My supervisor has a clear view of where our department is going and how to get there.

Question 60: The goals of my unit/department are clear to me.

Question 61: Work is organized so that each person can see the relationship between his/her job and the goals of the organization.

HYGIENE FACTORS (EXTRINSIC INDICATORS)

Senior Management

Question 62: Senior management demonstrates leadership practices that are consistent with the stated values of my unit/department.

Question 63: Senior management effectively communicates the goals and strategies of my unit/department.

Question 64: Senior management keeps employees informed.

Effective Supervisor

Question 65: My supervisor cares about me as a person.

Question 66: My supervisor considers my ideas.

Question 67: My supervisor gives me constructive feedback on my performance.

Question 68: My supervisor recognizes me for doing good work.

Question 69: My supervisor treats me with respect.

Question 70: My supervisor trusts me.

Question 71: My supervisor communicates well.

Question 72: My supervisor creates an environment that fosters trust.

Question 73: My supervisor deals effectively with poor performance.

Question 74: My supervisor is an effective decision-maker.

Question 75: My supervisor is approachable and easy to talk with.

Question 76: My supervisor is ethical in day-to-day practices.

Question 77: My supervisor manages people effectively.

Question 78: Overall, how would you rate your supervisor?

Good Relationship with Co-workers

Question 79: I am consistently treated with respect by my co-workers.

Question 80: I can count on my co-workers to help out when needed.

Question 81: I trust my co-workers.

Question 82: My co-workers and I work as part of a team.

Question 83: My workgroup collaborates effectively with other workgroups or departments.

Question 84: People care about each other in my unit/department.

Question 85: Someone in my unit/department cares about me as a person.

Question 86: When I joined my unit/department, I was made to feel welcome.

Question 87: My workgroup has enough employees to handle the work.

Question 88: The demands of my job interfere with my personal life.

Question 89: Work is distributed fairly within my workgroup.

Satisfaction with Salary

Question 90: I am fairly paid for the work I do.

Question 91: I understand how my base salary is determined.

Question 92: My salary/pay rate is a significant factor in my decision to stay at the organization.

Question 93: My salary/pay rate is competitive when compared to similar jobs at other
organizations.

Question 94: Salary/pay increases are appropriate.

Question 95: I would leave my unit/department for a similar job at a 5% higher salary.

Question 96: I would leave my unit/department for a similar job at the same salary.

Question 97: If it is up to me, I will be working in my unit/department one year from now.

Question 98: I would leave the organization for a similar job at a 5% higher salary.

Question 99: I would leave the organization for a similar job at the same salary.

Question 100: If it is up to me, I will be working at the organization one year from now.

Satisfaction with Benefits

Question 101: My costs associated with the benefits plan (co-pays, deductibles, premiums) are reasonable.

Question 102: The benefits package is a significant factor in my decision to stay at the Organization.

Question 103: The organization's benefits package has been adequately explained to me.

Question 104: The organization's benefits package meets my needs.

Presence of Core Values

Question 105: A climate of trust exists in my unit/department.

Question 106: All units/departments of the organization share common values.

Question 107: Attempts to create change are usually met with resistance.

Question 108: If I am unfairly treated, I believe I will be given a fair shake if I appeal.

Question 109: Ignoring core values at work will get you in trouble.

Question 110: Integrity is a hallmark of my unit/department.

Question 111: People in my unit/department are treated fairly.

Question 112: There is a clear and consistent set of values that governs the way we do business in my unit/department.

Question 113: Everyone is encouraged to voice their opinions, even if they are contrary to prevailing beliefs.

Question 114: Information about the organization is shared openly in my unit/department.

Question 115: Reasons for making changes are communicated at all levels before the change is made.

APPENDIX B

PERMISSION TO USE SURVEY INSTRUMENT

From: rsmerek@umich.edu [mailto:rsmerek@umich.edu]
Sent: Monday, July 06, 2009 9:14 PM
To: Gregory Beavers
Subject: Re: Article on Herzberg's Theory

Greg,

Thanks for your note. I'm happy to help. If you want actually, all of the items I used for the survey analysis are in the factor analysis table in the article. You can certainly use them at your own discretion. There are several more that didn't converge on a factor in the exploratory factor analysis and I didn't use those, but if you want, I can send that as well.

Ryan

Quoting Gregory Beavers <gbeavers2@triad.rr.com>:

Dr. Smerek,

I am a doctoral student at the University of North Carolina at Greensboro and I am interested in utilizing your conceptual model and survey instrument for my dissertation work on job satisfaction within the population of allied health faculty. In particular I am looking at radiologic technology, nuclear medicine technology, and radiation therapy program directors in the United States.

I am writing in hope that you would be willing to share your survey instrument in order to help me further my research. As you know, the ability to find a valid instrument which meets one's research needs can be a large hurdle and your assistance would be forever appreciated. I am aware that your study did not support Herzberg's theory, but I would like to test it on a different population and I think your approach was brilliant. I have been looking at all of the theories and something in the simplicity of Herzberg's ideas resonates with me.

Once again, I know this is a lot to ask from someone you have not met, but I hope you will appreciate the importance this is to my research. If you have any questions please let me know and I would like to take the opportunity to tell you how much I enjoyed your article.

Sincerely,

Gregory S. Beavers

APPENDIX C

CONSENT TO ACT AS A HUMAN PARTICIPANT

UNIVERSITY OF NORTH CAROLINA AT GREENSBORO

CONSENT TO ACT AS A HUMAN PARTICIPANT

Project Title:

The Predictive Value of Selected Extrinsic and Intrinsic Indicators of Overall Job Satisfaction in Diagnostic Radiological Technology, Radiation Therapy, and Nuclear Medicine Technology Allied Health Faculty

Project Director: Deborah Taub, Ph.D.

Student Researcher: Gregory S. Beavers

What is the study about?

This is a research project. The purpose of this research project is to examine the predictive power of selected intrinsic and extrinsic indicators, collectively and individually, as determinants of overall job satisfaction among faculty in diagnostic radiological technology, radiation therapy, and nuclear medicine technology.

Why are you asking me?

You are invited to participate in this study because you are an educator, faculty member, or program director of an allied health program accredited by the Joint Review Committee for Educational Programs in Radiologic Technology (JRCERT) or by the Joint Review Committee of Educational Programs in Nuclear Medicine Technology (JRCNMT).

What will you ask me to do if I agree to be in the study?

The procedure involves filling out an online survey that will take approximately 30 to 60 minutes. Your responses will be confidential and we do not collect identifying information such as your name or IP address. The survey questions will be about your perception of your work environment, your satisfaction with your job, and demographic data. No follow-up information will be requested.

Any questions about this research study should be directed to Deborah Taub, the primary researcher, by phone at (336) 256-1482. In addition, you may address your questions to Greg Beavers, the student researcher, by phone at (919)-843-2963 or by email at gbeavers@unch.unc.edu.

What are the dangers to me?

We do not anticipate any dangers to you for participating in this study. However, the survey will be transmitted over the internet and absolute confidentiality of data provided through the Internet cannot be guaranteed due to the limited protections of Internet access. Please be sure to close your browser when finished so no one will be able to see what you have been doing.

If you have any concerns about your rights, how you are being treated or if you have questions, want more information or have suggestions, please contact Eric Allen in the Office of Research Compliance at UNCG at

UNCG IRB
Approved Consent Form

Valid 4/22/10 to 4/21/13

(336) 256-1482. Questions, concerns or complaints about this project or benefits or risks associated with being in this study can be answered by Deborah Taub, the principal investigator, who may be contacted at (336)-334-4668.

Are there any benefits to me for taking part in this research study?

The results of this research may benefit you as an allied health educator, faculty member, or program director by identifying possible indicators of overall job satisfaction, providing possible tools for administrators to use to improve work environments, and to add to the literature on allied health faculty.

Are there any benefits to society as a result of me taking part in this research?

The results of this research may benefit society by improving the awareness of allied health educational program leaders and administrators to potentially overlooked or never before considered indicators of job satisfaction, which may indirectly improve allied health education.

Will I get paid for being in the study? Will it cost me anything?

There are no costs to you or payments made for participating in this study.

How will you keep my information confidential?

Absolute confidentiality of data provided through the Internet cannot be guaranteed due to the limited protections of Internet access. Please be sure to close your browser when finished so no one will be able to see what you have been doing. We will do our best to keep your information confidential. All data is stored in a password protected electronic format. To help protect your confidentiality, the surveys will not contain information that will personally identify you. The results of this study will be used for scholarly purposes only and may be shared with representatives of the University of North Carolina at Greensboro. All information obtained in this study is strictly confidential unless disclosure is required by law.

What if I want to leave the study?

You have the right to refuse to participate or to withdraw at any time, without penalty. If you do withdraw, it will not affect you in any way. If you choose to withdraw, you may request that any of your data that has been collected be destroyed unless it is in a de-identifiable state.

What about new information/changes in the study?

If significant new information relating to the study becomes available which may relate to your willingness to continue to participate, this information will be provided to you.

Voluntary Consent by Participant:

By clicking on the "agree button" at the bottom of this consent form you are agreeing that you read, and you fully understand the contents of this document and are openly willing consent to take part in this study. All of your questions concerning this study have been answered. By clicking on the "agree button" you are agreeing that you are 18 years of age or older and are agreeing to participate in this study described to you by reading the above information. If you do not wish to participate in the research study, please decline participation by clicking on the "disagree" button at the bottom of the form. There is no penalty for not participating in this research study.

UNCG IRB
Approved Consent Form

Valid 4/22/10 to 4/21/13

APPENDIX D**EMAIL INTRODUCING STUDY TO PARTICIPANTS**

Dear Colleague,

I am a fellow educator working in the School of Nuclear Medicine Technology at the University of North Carolina Hospitals in Chapel Hill, N.C. I am also a doctoral candidate in the Higher Education Department at the University of North Carolina at Greensboro. I need your help in order to perform my research and complete my dissertation. The title of my research paper is “The Predictive Value of Selected Extrinsic and Intrinsic Indicators of Overall Job Satisfaction in Diagnostic Radiological Technology, Radiation Therapy, and Nuclear Medicine Technology Allied Health Faculty”. In a few days, I will be sending you an email with a link to the survey I am using to gather my data. The survey should only take thirty to forty-five minutes and all information gathered will be completely confidential. In fact, the data will be de-identified during the analytic process and no individuals or institutions will be identified in the final paper. The Institutional Review Board at UNCG has approved this study.

Please take a small amount of time and complete the survey when it arrives in the next few days.

Thank you for your help,

Gregory S. Beavers, CNMT, RT(N)
Program Director
University of North Carolina Hospitals
Radiology Administration
101 Manning Drive
Chapel Hill, N.C. 27514
919-843-2963

APPENDIX E

EMAIL INVITATION TO POTENTIAL STUDY PARTICIPANTS

Dear Colleague,

I am a fellow allied health educator working in the School of Nuclear Medicine Technology at the University of North Carolina Hospitals in Chapel Hill, N.C. I am also a doctoral candidate in the Higher Education Department at the University of North Carolina at Greensboro. I need your help in order to perform my research and complete my dissertation. The purpose of this study is to examine the predictive power of selected extrinsic and intrinsic indicators, collectively and individually, as determinants of overall job satisfaction among faculty in diagnostic radiologic technology, radiation therapy, and nuclear medicine technology educational programs. You are invited to participate in this study because you are identified online by the JRCERT or the JRCNMT as a program director or faculty member in an accredited diagnostic radiologic technology, radiation therapy, or nuclear medicine technology. Programs not accredited by the JRCERT or the JRCNMT were excluded from this study.

The online survey should only take thirty to sixty minutes and all information gathered will be completely confidential. In fact, the data is completely anonymous and no individuals or institutions will be identified in the collection or the final paper. There is no reimbursement or compensation for your participation. The Institutional Review Board at UNCG has approved this study. In order to participate in the study please take the following link <http://www.surveymonkey.com/s/78M8BNZ>.

Thank you for your time and help,

Gregory S. Beavers, MBA, CNMT, RT(N)
University of North Carolina Hospitals
Radiology Administration
101 Manning Drive
Chapel Hill, NC 27514
919-843-2963

APPENDIX F**FIRST AND FINAL FOLLOW-UP EMAIL INVITATION
TO POTENTIAL STUDY PARTICIPANTS**

Dear Colleague,

I am a fellow allied health educator working in the School of Nuclear Medicine Technology at the University of North Carolina Hospitals in Chapel Hill, N.C. I am also a doctoral candidate in the Higher Education Department at the University of North Carolina at Greensboro. I need your help in order to perform my research and complete my dissertation. The purpose of this study is to examine the predictive power of selected extrinsic and intrinsic indicators, collectively and individually, as determinants of overall job satisfaction among faculty in diagnostic radiologic technology, radiation therapy, and nuclear medicine technology educational programs. You are invited to participate in this study because you are identified online by the JRCERT or the JRCNMT as a program director or faculty member in an accredited diagnostic radiologic technology, radiation therapy, or nuclear medicine technology. Programs not accredited by the JRCERT or the JRCNMT were excluded from this study.

The online survey should only take thirty to sixty minutes and all information gathered will be completely confidential. In fact, the data is completely anonymous and no individuals or institutions will be identified in the collection or the final paper. There is no reimbursement or compensation for your participation. The Institutional Review Board at UNCG has approved this study. In order to participate in the study please take the following link <http://www.surveymonkey.com/s/78M8BNZ>.

Thank you for your time and help,

Gregory S. Beavers, MBA, CNMT, RT(N)
University of North Carolina Hospitals
Radiology Administration
101 Manning Drive
Chapel Hill, NC 27514
919-843-2963