

FACULTY ON THE RESEARCH TRACK: EXPRESSIONS OF JOB SATISFACTION AND
ORGANIZATIONAL JUSTICE

By

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ABSTRACT

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Over the past several decades, tenure has been on the decline in institutions of higher education. In lieu of tenure-eligible positions, alternative faculty appointments have emerged such as contract-based appointments to teach or to do research. Although the presence of faculty appointed primarily to do research has increased in recent years, little is known about how these faculty members experience their work.

Through this dissertation study I sought to understand how faculty members, appointed on an established research track with existing policies and practices regarding promotion and participation in governance activities, within a medical school at an institution with a Carnegie classification of highest research activity, experience their work. Data collection for this qualitative study consisted of two face-to-face interviews, document analysis, and website review. The theoretical framework that guided this study included six dimensions of work defined by Kalleberg's (1977) theory of job satisfaction and three components of organizational justice, including distributive justice, procedural justice, and interactional justice defined by Cropanzano, Bowen, and Gilliland (2007). I developed a conceptual model incorporating the six dimensions of work and three components of organizational justice, which I revised based on the findings in this study.

Through the six themes and eighteen subthemes that emerged, the participants unveiled their experiences and perceptions working as research-track faculty members. All participants in the study expressed deriving satisfaction from the work itself. The participants also described

having access to resources to do their work. However, they overwhelmingly identified the lack of job security as a negative factor when assessing their job satisfaction.

The research-track faculty members in this study still expressed having an opportunity to build a career at MedU, though there were some constraints to achieving promotion due to the requirement to obtain funding in a funding environment that can be disadvantageous to research-track faculty who frequently do not have dedicated space or discretionary funds with which to develop an independent research program. Even though there was consensus that the environment at MedU was collegial, interactions outside of MedU with colleagues through conferences and through feedback received from grant reviewers were less positive.

For some research-track faculty who participated in this study, an additional detraction from job satisfaction was the limited opportunity to participate meaningfully in governance activities, which for these individuals, brought about a feeling of second-class status.

Although not generalizable to all institutions of higher education, the results of this study provide insights that are both timely and relevant. I provide a list of ten suggested practices that institutions of higher education can implement to develop or maintain a track for research faculty at their institution with an end goal of working toward enhancing job satisfaction and organizational justice for these members of the faculty.

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This dissertation is dedicated to my husband, Brad, and to my daughters Rebekah and Rachel.

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It has been a long and arduous process completing a Ph.D. while raising a family and working full time. My faith helped to carry me through. Philippians 4:13 was a source of strength and perseverance as I prayed over decisions and papers and stayed the course to completion.

I would also like to acknowledge the thirteen research-track faculty members who agreed to participate in this study. Without their time and commitment, this study would not have been possible. It is my hope that their participation may help to pave the way in some way for future faculty trying to make a career in academia under changing and difficult conditions.

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CHAPTER 1

Introduction

The growing phenomenon of researchers off the tenure-track in research universities has captured my attention and interest. Having worked for over a decade in research administration at a research I university in the Midwest, I noticed an increase in expectations for research productivity along with an increase in contractual appointments for faculty with research responsibilities. In today's increasingly competitive funding environment, I have witnessed contract-appointed researchers struggling to secure funding to maintain their positions and tenured professors doing the same to continue support for key personnel in their labs.

Some institutions, such as the institution where I worked recently, have started to develop career paths for faculty appointed to do research that provide opportunities for promotion, and the ability to submit grant applications as a principal investigator, a privilege that was previously extended only with limited exception to tenure-track faculty. It now appears that new career possibilities are taking shape for researchers without tenure eligibility. However, very little is known about this group of researchers, and there is little understanding about how they experience their work.

Together faculty members who are tenured and those who are not eligible for tenure provide the expertise and resources necessary to meet the mission of the institutions in which they work. While tenure-stream faculty has traditionally been responsible for fulfilling the multiple roles of teaching, research, and service, contract-appointed faculty members have been more typically specialized by function, being hired to teach or to conduct research exclusively (Rice, 2004). Members of the faculty within higher education are a key institutional resource (Finkelstein, Conley, and Schuster, 2016; Gappa, Austin, and Trice, 2007). Although the make-up of the faculty has been changing demographically as well as by appointment type, many

institutions have not actively taken steps to modify the way faculty members in this changing environment are supported (Gappa et al. 2007; Kezar, Maxey, and Holcombe, 2015).

The terms used to describe this growing group of faculty have also not changed. Contract-appointed members of the faculty are often described in deficit terms such as “contingent” faculty, or “fixed-term faculty”, or by terms that describe what they are not, such as “non-tenure-track” faculty. Rather than continue to use these terms, I refer to members of the faculty who are employed by contract to conduct research as “research-track” faculty. This description removes the assumption that members of this group are temporary or are less than the tenure-track faculty with whom they work. This description is also consistent with how the research site defines this group of faculty.

A gradual alignment with neoliberal ideology has been an arguable cause of the increasing use of contract-appointed faculty in higher education over the past several decades (Kezar and Maxey, 2015b; Saunders, 2010). Neoliberalism has been described as free market forces that have shaped or influenced institutions of higher education (Levin and Aliyeva, 2015). An example of this phenomenon is the institutional prioritization of revenue generation, cost-effectiveness, and economic efficiency (Saunders, 2010; Frye, 2017). Schwartz described the phenomenon of increasing contract appointments compared to tenure-track appointments as the “casualization” of the academic labor market (2014). As institutions have experienced financial volatility, they have pursued more flexible employment structures (Frye, 2017). While the number of tenure-eligible faculty members increased by twenty-three percent from 1977 to 2011, the number of contract-appointed full-time and part-time faculty members increased by 259% and 286% respectively during the same time period (Schwartz, 2010). The increase in contract-appointed faculty appointments across non-profit institutions has been documented to have risen

to about seventy percent of all instructional faculty (Eagan, Jaeger, and Grantham, 2015; Kezar et al., 2015).

Much of the focus on contract appointments in higher education has been on instructional faculty while the presence of research-track faculty has been largely ignored. Nevertheless, doctoral-level scientists and engineers who are principally involved in research activities, but who are not members of the regular faculty as defined by the National Science Foundation, have increased from 9,527 in 2005 to 23,706 in 2014. (National Science Foundation, 2016). This group has been steadily growing but has commanded little attention from scholars, administrators, and other stakeholders in higher education.

The research enterprise plays an increasingly significant role in higher education. According to the American Association for the Advancement of Science, federal spending on research and development has more than doubled since 1976 (Bergom, Waltman, August, and Hollenshead, 2010). Further, the federal government funds approximately \$37.9 billion annually in university research and development grants and contracts (National Science Foundation, 2016). Fluctuations in the federal budget have also had a significant impact on the ability of faculty members in academia to secure funding to support their research. Between 1998 and 2003, when the National Institutes of Health (NIH) budget nearly doubled from approximately \$13 billion to \$27 billion, the success rate for the R01, the gold standard research grant offered by the NIH, peaked at 26% (Daniels, Beninson and National Academies of Sciences, 2018). More recently, as the number of investigators seeking funding has increased and appropriations to the NIH have declined, the success rate for R01 grants has decreased substantially (Daniels et al., 2018).

The current biomedical system in the United States has been described as systemically flawed (Alberts, Kirschner, Tilghman, and Varmus, 2014). There is a severe imbalance between the amount of funding available for research and the size of the scientific community in the United States, which continues to grow (Alberts et al., 2014). The result is a hypercompetitive environment that threatens the future of biomedical research and the careers of new scientists entering the field (Alberts et al., 2014). The federal research budget has not kept pace with expanding opportunities and rising costs, and it has declined by more than twenty percent after adjusting for inflation since 2003 (Federation of American Societies for Experimental Biology, 2015).

Research is also an expensive endeavor. When taking into consideration start-up packages, behind the federal government, higher education institutions are the second largest funder of basic science research (Daniels et al., 2018). The hypercompetitive funding climate has made it increasingly difficult for young investigators to establish careers. Scientists have been spending more time writing grant applications and less time actually doing research. Nearly two-thirds of early career scientists have said that they have considered leaving science at some point in their career, and investigators are leaving the NIH-funded workforce at an accelerated pace compared to years past (Daniels et al., 2018). When people leave the science workforce, this diminishes the federal investment in training biomedical researchers (Federation of American Societies for Experimental Biology, 2015).

After analyzing multiple reports that were produced since 2012, Pickett and colleagues found that there is consensus that steps need to be taken to make the biomedical research enterprise sustainable in the future (Pickett, Corb, Matthews, Sudquist, and Berg, 2015). The challenges that Ph.D.'s in the biomedical sciences face to establish careers in academia can also

lead to the loss of critical talent affecting the sustainability of the research enterprise. Careers are taking longer to establish, and with more difficulty. The National Academy of Sciences reported in 2018 that in 1973, 55% of Ph.D.'s in biomedical sciences successfully obtained a tenure-track position within six years, while in 2009, only 18% of Ph.D.'s were able to find such a position within the same timeframe (Daniels et al., 2018). Further, the average age of first receipt of a major grant from the NIH rose from thirty-six years of age in 1980 to forty-three years of age by 2016 (Danielset al., 2018). Seven reports analyzed by Pickett and colleagues suggested that institutions develop a career path for staff scientists which are formal positions with pay scales, which can provide continuity in labs and increased productivity (Pickett et al., 2015). Daniels and colleagues observed in a recent report that there are far fewer opportunities to establish long-term careers in academia than there are qualified scientists to do this work (2018). The current career and funding environment for Ph.D.'s in biomedical sciences provides additional justification of the need to understand how research-track faculty experience their work.

A strong scientific work force is also necessary to ensure that the United States maintains its strong position as a leader in scientific innovation (Xie and Killewald, 2012). Scientific discovery is essential to the strength of our health, economy, and society (Daniels, 2015). Research-intensive postsecondary institutions are increasingly relying on research funding to provide a source of revenue to the institution and to increase the institution's ranking and prestige. Institutional reliance on an unexplored faculty group to carry the research enterprise forward into the future may be a risky proposition that can hinder institutional excellence and performance. Given the importance of the research enterprise to a research university's mission and success, it is vital that administrators understand how research-track faculty experience their

work environment, and how this experience impacts their job satisfaction, perceptions of justice and ultimately, performance.

Statement of the Problem

The traditional academic model of tenure in higher education has eroded as institutions have with little deliberation hired an increasing number of contract-appointed faculty members to meet short terms needs (Kezar and Maxey, 2015a). There has been no evidence that these recent hiring patterns in higher education will change (Finkelstein, Conley and Schuster, 2016). To maximize institutional excellence and success, it is imperative that administrators understand and attend to the experience of research-track faculty.

Contract-appointed instructional faculty has received considerable attention in the literature over the past decade (Baldwin and Chronister, 2001; Kezar, 2012; Schuster and Finkelstein, 2006; Umbach, 2007). Previous research indicates that contract-appointed instructional faculty members often experience inferior working conditions that negatively impact their capacity to perform resulting in reduced quality of teaching and diminished student learning outcomes, lower graduation rates, and lower retention and transfer rates from two-year to four-year institutions for students who take more courses with contract-appointed faculty (Jaeger and Eagan, 2011; Kezar, 2013a; Kezar and Maxey, 2015b; Maxey and Kezar, 2015; Umbach, 2007).

While scholars have addressed contract-appointed faculty members as teachers, literature about members of this faculty group who are engaged in research is scarce. The increase in research-track faculty has been documented, but these members of the faculty have for the most part not been recognized (Bergom et al., 2010; Voosen, 2015). The traditional career path for emerging academic scientists is shifting. There is no longer an adequate number of tenure-track

faculty positions available to support the number of qualified Ph.D. level scientists who wish to pursue careers in academia (Offord, 2017). However, appointments for research-track faculty have grown. This appointment type may provide a viable career path for some scientists while also providing a fresh perspective and expertise to the institutions of higher education that employ them.

While poor working conditions have been shown to constrain the performance of contract-appointed faculty members in the classroom, the potential existence and impact of such conditions on the work of research-track faculty has been largely unexplored. Developing an understanding of how research-track faculty experience their work through dimensions of job satisfaction and perceptions of organizational justice in this shifting environment, where faculty-appointments have become increasingly bifurcated and the funding environment is constrained, can provide useful insights for administrators and other stakeholders to determine how this group of faculty can be best supported to optimize institutional excellence and effectiveness.

Locke defined job satisfaction as “the pleasurable emotional state resulting from the appraisal of one’s job as achieving or facilitating the achievement of one’s job values” (1969, p. 316). Locke described job satisfaction and dissatisfaction as “a function of the perceived relationship between what one wants from one’s job and what one perceives it as offering or entailing” (1969, p. 316). Job satisfaction is closely tied to an individual’s perceptions of their work experience.

Scholars have agreed that perceptions of fairness or justice within an institution impact job satisfaction (Hagedorn, 2000; Bozeman and Gaughan, 2011) and that perceptions of justice influence the behavior of scientists in positive and negative ways (Martinson, Anderson, Crain, and de Vries, 2006). Justice perceptions influence organizational commitment, performance, and

organizational citizenship behaviors (Roch and Shanock, 2006), as well as the potential to engage in scientific misconduct (Martinson, Crain, de Vries, and Anderson, 2010). Job satisfaction and organizational justice concepts will inform the design of this study and organization of the resulting data.

Some institutions of higher education in the United States have developed policies and procedures, as well as a career ladder, for research-track faculty. These institutions provide a valuable setting within which to explore the experience of these researchers. The institution that will be the subject of this study, Medical University (MedU), is an R1 Doctoral University with a Carnegie Classification of Highest research activity. MedU is a public university with a total enrollment of 46,000. MedU has an established research-faculty track that has been in place for several decades. This track is split into research scientist and research professor tracks with differing requirements and expectations for each. Key characteristics of the research scientist track include a scholarly reputation that is equivalent to that of a person who has completed a Ph.D. and/or postdoctoral training and limited requirements for independence, teaching, or institutional service. The research professor track, on the other hand, requires potential for scholarly development equivalent to that of a tenure-track position, and has an expectation of evidence of or potential for teaching as well as institutional service. MedU has established policies, practices, and a career ladder for research-track faculty. This institution has also reported to the National Science Foundation the presence of over 500 Ph.D.-level researchers employed by the institution. This institution provided a robust group of research-track faculty from which to recruit a study population.

Purpose of the Study

The purpose of this qualitative study was to develop an understanding of how research-track faculty working in biomedical sciences in the medical school of a research university with highest research activity experience their work. The overarching question I sought to explore through this research asks how research faculty, including assistant research scientists and research assistant professors working in an institution with established policies and practices specific to this appointment type, experience their work.

This research was guided by the following research questions:

1. How do assistant research scientists and research assistant professors in a medical school at a research university with highest research activity and also with developed policies and practices specific to this research track experience determinants of job satisfaction and dissatisfaction in their work environment?
2. How do assistant research scientists and research assistant professors in a medical school at a research university with highest research activity and also with developed policies and practices specific to this research track experience elements of organizational justice in their work environment?
3. How do assistant research scientists and research assistant professors experience their work in comparison to each other?

Theoretical Framework

The study's design has been informed by a theoretical framework that incorporates Kalleberg's (1977) six dimensions of work values and three components of organizational justice as defined by Cropanzano, Bowen, and Gilliland, (2007). Scholars have recognized the impact of

individual worker perceptions of work (Locke, 1969; Kalleberg, 1977), and perceptions of organizational justice (Hagedorn, 2000) on job satisfaction.

Kalleberg's Six Dimensions of Work. Kalleberg recognized the importance of considering individual differences in workers' experience of job satisfaction when workers have the same job characteristics (Kalleberg, 1977). Kalleberg (1977) confirmed that work values have significant effects on job satisfaction, and he suggested a framework linking the variation in job satisfaction to factors that influence attainment of job-related rewards. He acknowledged that people may impute different meanings to their jobs, and that they may seek different rewards. Individual differences are particularly pertinent to contract-appointed faculty, a heterogeneous group consisting of individuals with variations in experience, contract type, age, motivation, discipline and department to name a few differences (Kezar and Sam, 2010). Recognizing that workers can be diverse and heterogeneous, in an effort to capture the variety of meanings workers impute to their work Kalleberg (1977) identified six dimensions of work that are differentially valued, including: intrinsic, convenience, financial, relationships with co-workers, career, and resource adequacy.

Definitions of dimensions of work. Kalleberg (1977) defined the dimensions of work that I have used in the conceptual framework for this study. It is helpful to understand how these dimensions may come into play in how assistant research scientists and research assistant professors experience job satisfaction or dissatisfaction in their work. I have provided definitions of each of the dimensions below.

Intrinsic dimension. Kalleberg (1977) described the intrinsic dimension as characteristics of the job itself, such as “whether it is interesting, allows the worker to develop and use his/her abilities, allows the worker to be self-directive and whether the worker can see the results of the

work” (1977, p. 128). For the purpose of the conceptual model for this study, I have labeled intrinsic factors as “The Work Itself” which encompasses the characteristics described by Kalleberg (1977).

Extrinsic dimensions. The remaining dimensions of work Kalleberg (1977) defined in his theory of job satisfaction are extrinsic and include the following dimensions: convenience, financial, resource adequacy, career, and relationships with co-workers.

Convenience. Kalleberg (1977) described the convenience dimension as “creature comforts” (p. 128) which include “convenient travel to and from work, good hours, freedom from conflicting demands, pleasant physical surroundings, no excessive amounts of work, enough time to do the work and an opportunity to forget about personal problems” (p. 128).

Financial. The financial dimension encompasses pay, benefits, and job security. Kalleberg (1977) tied this dimension to money and described this dimension as reflecting a worker’s desire to receive current and future financial rewards from the job (1977).

Resource adequacy. Resource adequacy concerns whether a person has sufficient resources to effectively complete the job. Kalleberg described this dimension as including things such as “whether the help, equipment, authority and information required for job performance are adequate, whether co-workers are competent and helpful, and whether the supervision is conducive to task completion” (1977, p. 128).

Career. The career dimension includes opportunities that the job provides for a career, such as whether the job provides the possibility of promotion, whether promotions are handled justly, and whether the employer encourages employees to advance (Kalleberg, 1977). Kalleberg described the career dimension as an indication of an employee’s desire to advance and be recognized (1977).

Relationships with co-workers. Kalleberg described this relational dimension as a valuation of a “worker’s desire for the satisfaction of social needs from work activity” (1977, p. 128). Social needs can be met by the opportunity to make friends, by having colleagues who are friendly and helpful, and by working with others who take a personal interest in the individual (Kalleberg, 1977). I have included collegiality, a significant aspect of faculty work in academia, in this dimension.

Kalleberg indicated that to measure the types and amounts of rewards people receive from jobs, the worker should be consulted, because “it is not the ‘objective’ state of these characteristics that affects employee attitudes and behavior, but how they are experienced by the worker” (1977, p. 130). Kalleberg’s (1977) framework provides a logical lens through which to consider research-track faculty members’ perceptions of their work environment. Kalleberg’s work dimensions inform the design of this study and organization of the data along with three measures of organizational justice discussed below.

Organizational Justice. Organizational justice is a term that was first used to refer to individuals’ perceptions of fairness in organizations (Colquitt, Greenberg, and Zapata-Phelan, 2005). Organizational justice has been described as a subjective phenomenon rather than an objective reality that needs to be understood and managed (Cropanzano et al., 2007). Just treatment can provide certainty regarding future outcomes, and it can be an indicator of respect by a larger group providing a sense of belonging (Cropanzano et al., 2007). Perceptions of justice in the work environment impact how job characteristics are experienced, and have an impact on job satisfaction.

Cropanzano and colleagues defined organizational justice as a “personal evaluation about the ethical and moral standing of managerial conduct” (2007, p. 35). They provided three reasons

why justice matters to people, including long-range benefits, social considerations, and ethical considerations. Concerning long-range benefits, justice helps employees judge how they are likely to be treated over time in an organization. For example, appropriate personnel policies can serve as an indicator that the future will work out (Cropanzano et al., 2007). Social considerations are important because people “wish to be accepted and valued by important others while not being exploited or harmed by powerful decision-makers” (Cropanzano et al., 2007, p. 36). Just treatment brings about feelings of respect and recognition by the larger group in an organization. Ethical considerations also lead people to care about justice because they think others should be treated justly. When people witness injustice against another, this can cause them to experience stress themselves as a result, which can negatively impact their work group (Cropanzano et al., 2007). Justice has been described as a “sort of buffer, allowing employees to maintain respect and trust for an organization even when things do not go as they would have liked” (Cropanzano et al., 2007, p. 45).

Perceptions of justice have been identified as a possible strong predictor of satisfaction when considering equity regarding salary levels, practices of promotion, hiring, awarding of tenure, and nomination for awards (Hagedorn, 2000). Faculty members who perceived a high level of justice within their institutions have also reported much higher levels of job satisfaction than those whose perceptions of justice were low (Hagedorn, 2000), and job satisfaction is promoted when people are treated fairly (Greenberg, 2011).

Employees typically assess three areas of justice including: the justice of outcomes (distributive justice), the justice of formal allocation processes (procedural justice), and the justice of interpersonal interactions with others (interactional justice) (Cropanzano et al., 2007).

These measures of organizational justice overlap with several of Kalleberg's (1977) dimensions of work and will extend and deepen the theoretical framework for this study.

Distributive justice. Distributive justice concerns “allocations or outcomes that some get and others do not” (Cropanzano, Bowen, and Gilliland, 2007, p. 37). Cropanzano and colleagues identified three allocation rules that when applied appropriately can result in distributive justice, including: equality (to each the same), equity (to each according to contributions), and need (to each according to the most urgency) (2007). Equity is most often used to reward individuals while equality is more typically used to build team cohesion. Allocating non-monetary awards equally can signal that everyone is equally important and respected in the organization (Cropanzano et al., 2007).

Procedural justice. Research has shown that just procedures can “mitigate the ill effects of unfavorable outcomes” “(Cropanzano et al., 2007, p. 38). Procedural justice includes factors such as consistency (whether all employees are treated the same), lack of bias (no person or group is specifically identified for ill-treatment), accuracy (decisions are based on accurate information), representation of all concerned (appropriate stakeholders have input into decisions), correction (there is a process available to fix mistakes), and ethics (norms of professional conduct are followed) (Cropanzano, 2007). When employees feel that a process is just, they are more likely to be loyal toward the organization including behaving in the organization's best interests (Cropanzano et al., 2007).

Interactional justice. Interactional justice encompasses both informational justice, whether one is being truthful and is providing adequate information, and interpersonal justice, whether one is being treated with dignity and respect (Cropanzano et al., 2007).

Summary. Perceptions of both Kalleberg's (1977) dimensions of work and organizational justice described by Cropanzano and colleagues (2007) simultaneously impact an individual's job satisfaction. Because the use of both frameworks together is new, I have created a conceptual model (see Figure 1) to illustrate how the two complement each other. At the center of the model, I have placed Kalleberg's (1977) intrinsic dimension, the work itself. I placed the intrinsic factor at the center because I believe that academic careers are unique. It has been shown that non-tenure track faculty often experience poor pay, low job security, and low recognition (Kezar, 2013b). Nevertheless, this group of faculty still expresses a love of doing the work, which brings other rewards. Therefore, I think the intrinsic dimension is particularly relevant to job satisfaction for non-tenure track faculty.

The next ring includes Kalleberg's (1977) extrinsic dimensions. These dimensions include work values that contribute to or take away from a worker's job satisfaction depending on what the individual values. For example, one person may value the convenience dimension that allows work without too many demands and convenient hours, whereas another person may be looking for career growth and financial rewards. Two such individuals would assess their own job satisfaction based on very different factors.

The third ring in the conceptual model includes the three components of organizational justice including: distributive, procedural, and interactional justice. Perceptions of organizational justice can improve or diminish perceptions of job satisfaction. The three components of organizational justice overlap with several of the extrinsic factors. Distributive justice, which covers the distribution of rewards, is relevant to financial, resource adequacy, and career factors. For example, for a person who values career growth and financial rewards, perceptions of

injustice pertaining to promotions and pay increases will be much more salient to their perceptions of job satisfaction than the person who values convenience or relationships.

Procedural justice also overlaps with financial, resource adequacy, and career factors. Procedural justice concerns how things are done. For example, procedural justice requires following procedures and practices consistently, and ensuring that no individuals receive more favorable or less favorable treatment than others. Lastly, interactional justice overlaps with the relationships dimension. Interactional justice requires that people be treated with dignity and respect, which includes being provided with honest and adequate information at work.

The intrinsic factor at the center of the model is more steady than the outer two rings. The intrinsic factor is likely to be stable until job responsibilities change, or until an individual no longer values the work they are doing. However, the outer two rings in the conceptual model are more fluid. The value that people assign to different extrinsic dimensions is likely to vary over time as life stages and career goals change. Perceptions of organizational justice may also change over time due to changes in the work environment, such as, for example, changes in organizational leadership and culture.

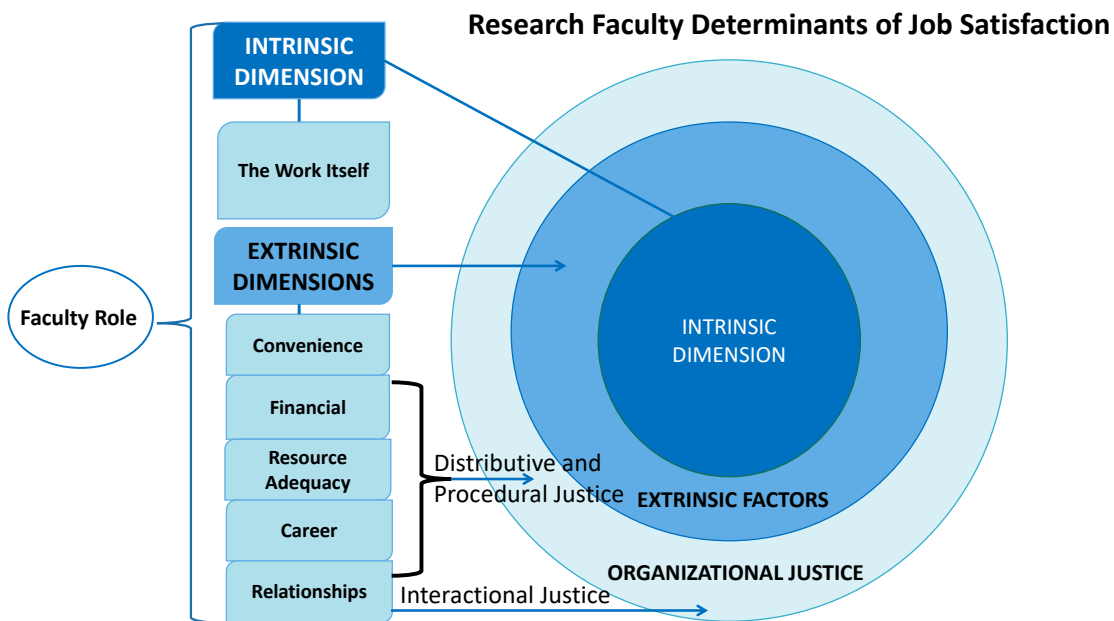


Figure 1: Conceptual Model of Research Faculty Determinants of Job Satisfaction

Significance of the Study

Even though the presence of research-track faculty is growing and the importance of the research enterprise to institutional excellence and to the strength and viability of the future of American science is significant, little is known about this group of faculty. We do know that contract-appointed faculty in the classroom experience working conditions that hinder their performance, and consequently, the learning outcomes of the students they teach. Investigating research-track faculty members' experience as research-track faculty framed by a job satisfaction and organizational justice framework may provide important insights so that institutions can optimize the work environment for all members of the faculty, thereby maximizing satisfaction and performance in the research enterprise.

CHAPTER 2

Literature Review

The following literature review provides foundational information about the research enterprise in American higher education. Included in this literature review is a discussion of changes in the landscape of academic research such as the increasingly unstable nature of federal funding and faculty appointments that have shifted to include more contract-appointed appointments, not only for faculty members with primary teaching responsibility, but also for those with primary responsibility in research. In the literature review I discuss previous studies of job satisfaction providing a justification for the selection of Kalleberg's (1977) work values as a component of the theoretical framework for this study. I also provide an overview of an additional component of the theoretical framework, organizational justice, as defined by Cropanzano and colleagues (2007), which is particularly salient to contract-appointed faculty members who may experience inferior working conditions.

The Academic Research Enterprise and Structure of American Science.

History. Beginning with the Morrill Act of 1862 and subsequent land grant acts, a partnership was established between the federal government and states to build universities that paved the way for a future research enterprise (Committee on Research Universities, 2012). Development of the research enterprise in the United States was influenced by the needs of the military when a small group of academic scientists initiated the eventual founding of the National Academy of Sciences in 1863 in response to the government's need for scientific advice during the Civil War (Dill and Van Vught, 2010). Industrialization from 1860 to 1930 led to rapid economic growth, and the eventual development of pure and applied sciences (Xie and Killewald, 2012).

Through the government's partnership with universities, basic research flourished and provided a source of new innovations, intensifying during World War II (Committee on Research Universities, 2012). Before World War II research was primarily conducted by individual researchers and inventors in industry, however, this changed significantly during the war. Emerging from World War II, Congress invested heavily in basic research and graduate education to build the American research university (Committee on Research Universities, 2012). During the 20th century in the United States, science was transformed into a profession by meeting three necessary requirements to achieve professional status, including: 1) self-regulation or autonomy, 2) systematic training for qualification, and 3) payment for services. (Xie and Killewald, 2012). European scientists did not yet have all of these elements of professional status. Even though research scientists achieved professional status, the availability of government funding continues to exert a significant influence on the research enterprise.

Future status. Despite the strength of the American research enterprise, significant challenges lie ahead. Federal funding in the United States has been unstable while countries around the globe have been increasing their investment in research and development (Committee on Research Universities, 2012). As an example, funding from the largest funder of biomedical research in the world, the National Institutes of Health, has declined since FY 2009 due to the recession from December 2007 through June 2009, and due to budget sequestration in 2013 (Pool, Wagner, RoyChowdhury, Berhane, Wu, and Schafer, 2016). The cost of conducting research is increasing while the funds available to support it are declining (Federation of American Societies for Experimental Biology, 2015). After adjusting for inflation, the federal investment in the life sciences has decreased by more than twenty percent since 2003 (Federation of American Societies for Experimental Biology, 2015). Institutions of higher education are also

increasingly requiring researchers to cover part of their salary with research grants, which has contributed to the severe imbalance between the number of research grants available and the number of applications submitted for funding (Federation of American Societies for Experimental Biology, 2015).

Structure. The academic research enterprise consists of the research activity in the academic sector (Dill and Van Vught, 2010). For purposes of this study, the academic research enterprise when referenced refers to research activity in the United States. American research universities account for 35 to 40 of the top 50 globally ranked research universities in the world (Committee on Research Universities, 2012).

To understand the American research enterprise, it is suggested that one understand three pillars or fundamental drivers of the research system including: 1) a talented and interconnected workforce, 2) adequate and dependable resources, and 3) world-class basic research in all major areas of science (Celeste, Griswold, and Straf, 2014). One suggestion to support a talented and interconnected workforce is “supporting research environments that nurture the creativity, ingenuity, and passion of talented researchers” (Celeste et al., 2014, p. 15). Examples of adequate and dependable resources that allow for research excellence include scientific infrastructure and major research instruments or equipment (Celeste et al., 2014). The existence of a supportive environment and adequate resources are critical to all faculty who engage in research activities, regardless of their appointment type.

Labs in the United States are typically structured as pyramids (Stephan, 2012). The faculty PI is at the top of the structure, followed by postdoctoral trainees, then graduate students, followed by undergraduate students. Staff scientists in contract-appointed research positions also fill roles in labs (Stephan, 2012). Traditionally, faculty recruit Ph.D. students who aspire to

careers in academia to work in their labs. After students finish their degree, it is required in most fields to obtain more training as a postdoctoral researcher. However, in many fields the transition from a postdoctoral researcher to an independent faculty member has been difficult as the number of tenure-track positions has not kept pace with the demand (Stephan, 2012). Even though greater than 50 percent of Ph.D.'s in the biological and life sciences identified a faculty career as their career path of choice, as of 2013 only 18 percent of U.S.-trained Ph.D.'s had a tenure-track position within six to ten years after completing their training (Daniels, Beninson and National Academies of Sciences, 2018). Although shortages of research scientists were predicted in the late 1980's and early 1990's, this prediction never materialized (Stephan, 2012). In physics and biological sciences, contract-appointed positions in academe "virtually did not exist" in the mid-1990s (Stephan, 2012, p. 161). The rise of contract-appointed research faculty is a recent phenomenon.

A further change in the research enterprise has been the increasing scale, complexity, and cost of doing research leading to the gradual transition to team-based research (Wuchty, Jones, and Uzzi, 2007). Fortunato and colleagues described science as a "complex, self-organizing, and constantly evolving multiscale network" (Fortunato, Bergstrom, Borner, Evans, Helbing, Milojevic, . . . Barabasi, 2018).

The Professoriate in Historical Context. To bring context to this developing issue, it is helpful to first briefly address the role faculty has played historically in institutions of higher education. Faculty positions were not historically a career path. Rather, during the first half of the eighteenth century, new baccalaureate graduates took on roles as tutors to provide mentoring, moral oversight, and guidance for undergraduate students (Finkelstein, Conley, and Schuster, 2016). A core of permanent faculty who were assigned to a specific subject area developed

during the second half of the eighteenth century (Finkelstein et al., 2016). Most often professors spent their entire careers at one institution, usually their alma mater, and they typically did not consider a professorship to be their primary career. A bifurcated faculty had developed by 1800 with permanent professors who were older and more experienced than the tutors who still comprised the majority of the college teachers (Finkelstein et al., 2016).

During the nineteenth century, faculty were specialized and taught in their field. This specialization was thought to need formal preparation through graduate education, but such graduate education was only available in Europe and was rarely obtained. The preparation required to join the professorial ranks was too extensive to justify a transitory position such as had been the case with tutors. Academics became known as experts, which then precipitated the pursuit of academic freedom and professional autonomy (Finkelstein et al., 2016). A core of permanent specialized professors had developed by the first quarter of the nineteenth century. By the early twentieth century, the American Association of University Professors (AAUP) was founded leading the way to development of tenure established in the Statement of Principles of Academic Freedom and Tenure in 1940. By the mid-1940's the graduate education model was in place, along with a formalized system of academic ranks (Finkelstein et al., 2016).

During the late twentieth century and also into the early twenty-first century, there has been a significant growth of faculty appointments, the majority of which have been nontraditional appointments. Non-tenure track appointments now constitute the majority of all new full-time faculty appointments with appointments on the tenure track declining (Finkelstein et al., 2016).

The Changing Professoriate. Baldwin and Chronister (2001) described the development of a bifurcated faculty, including those eligible for tenure, and those without such eligibility.

Schuster and Finkelstein noted that “term-limited full-time positions have become the modal type of full-time appointment for new entrants to academic careers” (2006, p. 195). By 1992, “off-track appointees were disproportionately focused on research” (2006, p. 195). However, these numbers shifted by 1998 when term faculty were more likely than tenure line faculty to report teaching as their primary responsibility (Schuster and Finkelstein, 2006). Even though the use of contract-appointed appointments for teaching has grown at a faster pace than contract-appointed appointments for research, reliance on contract-appointed researchers continues to increase.

The presence of contract-appointed faculty members across non-profit institutions in the U.S. has risen in recent years to about seventy percent of all instructional faculty (Eagan, Jaeger, and Grantham, 2015; Kezar et al., 2015). The number of contract-appointed faculty with primary responsibility in research has not been analyzed in detail. The professoriate has not only changed by appointment type, the demographics of the faculty have also been changing. Faculty members are more diverse than they were in the past, and many early-career faculty place higher priority on work-life balance prioritizing their personal lives more than the faculty who preceded them (Gappa et al., 2007). The traditional tenure system may not be appropriate for all members of the faculty. Based on their review of theories of work motivation and satisfaction, Gappa and colleagues (2007) advocated that institutions actively work to improve the work environment of all faculty, including contract-appointed faculty, to enhance their contributions to the institution.

Faculty Satisfaction. There are many factors that contribute to faculty satisfaction in higher education that are dependent on context and individual preferences and characteristics. Researchers studying job satisfaction have considered as variables a combination of demographics such as gender, ethnicity, job achievement, nature of work, salary, collegial

relationships, and rank and tenure (Sabharwal and Corley, 2009). Eagan and colleagues (2015) described job satisfaction as “a multifaceted, complicated construct” with “as many ways of operationalizing satisfaction as there are studies examining it” (p. 451). Gappa and colleagues (2007) indicated that “experiencing a sense of belonging, growing professionally, feeling respected, and having autonomy in one’s work are key concepts that run through the literature on workers’ satisfaction” (p. 123). This conceptualization of the job satisfaction literature is particularly salient to contract-appointed faculty who have reported feelings of isolation and marginalization in past studies (Eagan et al., Kezar, 2013c.)

Eagan and colleagues (2015) considered job satisfaction of contract-appointed faculty and described the landscape of job satisfaction literature including consideration of individuals’ needs and values as explored by Locke (1969), and as considered through intrinsic and extrinsic attributes by Kalleberg (1977). Eagan et al. acknowledged that scholars have used diverse datasets and satisfaction scales to study job satisfaction. The authors devised a conceptual framework that incorporates Maynard and Joseph’s (2008) underemployment theory, and Alderfer’s (1972) reconceptualization of Maslow’s need theory that focused on basic needs of (E) existence, (R) relatedness, and (G) growth with a desire to move away from a deficit perspective that has characterized past studies of contract-appointed faculty.

The authors used data from the 2010-2011 administration of the HERI faculty survey which included 4,169 part-time employed faculty respondents. They found that part-time faculty in the study were not satisfied with relationships with colleagues and administrators, and that as this higher order need was not met, lower order needs, such as working conditions, had increasing importance. The authors also found a connection between respect and job satisfaction for part-time faculty members. When the faculty participants perceived a reduced level of respect

from colleagues, they reported less satisfaction with other elements of faculty work, such as collegiality, autonomy, and leadership. The authors argued that respect is also exhibited by institutional resources that are allocated in support of part-time faculty. In conclusion, Eagan et al. (2015) argued that university administrators should provide professional development activities, such as opportunities to engage in career development, that will allow professional growth to meet faculty members' higher order needs including self-esteem, growth, and self-actualization. They also suggested that administrators can cultivate respect for part-time faculty members by providing opportunities for this faculty group to become more integrated into the institution through participation in institutional decision making, input into curricular matters, and having more visibility in the department. While this research was conducted with part-time contract-appointed faculty, the findings could potentially extend to full-time contract-appointed faculty as well.

Hagedorn (2000) also developed a conceptual framework of faculty job satisfaction in the context of college and university faculty that incorporates multiple elements of the job satisfaction literature. Hagedorn described the model as one that “hypothesizes two types of constructs that interact and affect job satisfaction – triggers and mediators” (p. 6). Hagedorn defined a “trigger” as “a significant life event that may be either related or unrelated to the job” (p. 6) which may result in changes to the self and point of reference, as well as to work-related responses. She defined a “mediator” as a “variable or situation that influences (moderates) the relationships between other variables or situations producing an interaction effect” (Hagedorn, p. 6). Hagedorn identified six unique triggers for the model: 1) change in life stage 2) change in family-related or personal circumstances; 3) change in rank or tenure; 4) transfer to a new institution; 5) change in perceived justice; and 6) change in mood or emotional state, and three

types of mediators: 1) motivators and hygienes; 2) demographics; and 3) environmental conditions.

Hagedorn (2000) tested her proposed job satisfaction model using a multiple regression equation. The mediators with the highest predictability for job satisfaction were the work itself, salary, relationships with administrators, student quality and relationships, and institutional climate and culture. Hagedorn found that faculty perceptions of a higher level of justice were related to higher levels of job satisfaction.

Hagedorn's inclusion of motivators and hygienes as mediators derived from Herzberg's theory of motivators and hygeines developed in the 1950's and 1960's, a seminal contribution to the job satisfaction literature (2000). Motivators, or satisfying events identified by Herzberg and colleagues include achievement, recognition, work itself, responsibility, advancement, and growth (Smerek and Peterson, 2007). Hygiene factors that were identified to decrease dissatisfaction include: company policy and administration, supervision, relationship with supervisor, work conditions, salary, relationships with peers, personal life, relationships with subordinates, status, and security (Smerek and Peterson, 2007).

Herzberg's duality theory has been criticized for not taking into account individual differences among workers with the same job characteristics (Kalleberg, 1977) and for not being sufficiently complex to distinguish between internal and external dimensions of job satisfaction (Smerek and Peterson, 2007). Scholars have often concentrated on hygiene factors when applying Herzberg's two factor theory which does not give adequate emphasis to intrinsic motivators that often drive faculty job satisfaction, such as enjoyment of the work itself (Kezar and Sam, 2010). Herzberg's two factor theory was also found to be inconsistent with factors related to institutional policy and administration and recognition in a higher education context

(Waltman, Bergom et al., 2012). Smerek and Peterson (2007) identified Kalleberg's (1977) theory of job satisfaction as a more complex conceptualization of job satisfaction.

Kalleberg (1977) developed a model of job satisfaction outside the field of higher education that linked variations in job satisfactions of individuals to factors that influence their degree of control over attainment of rewards. Kalleberg (1977) recognized that job satisfaction is a multi-dimensional construct, and that people may balance satisfactions against dissatisfactions to come up with a composite satisfaction with their overall job. Kalleberg (1977) described two types of factors that are operative in the variation of job satisfaction including: perceived job characteristics that represent the amount of satisfaction available from different dimensions of work, and work values, that represent the meanings that people attach to perceived job characteristics. Along with an intrinsic dimension, Kalleberg (1977) identified six dimensions of work that are valued differently including: convenience, financial, relationships with co-workers, career, and resource adequacy. Kalleberg (1977) confirmed that work values have significant effects on job satisfaction, and he suggested a framework linking the variation in job satisfaction to factors that influence attainment of job-related rewards.

Kalleberg's (1977) six dimensions of work are consistent with determinants of job satisfaction that have been addressed in the literature concerning contract-appointed faculty. Contract-appointed faculty members have expressed satisfaction with work flexibility (Waltman et al., 2012), which is consistent with the convenience value. Job security, a financial value, has also been recognized as a determinant of dissatisfaction for contract-appointed faculty (Kezar, 2013b). Relationships with co-workers through respectful treatment and inclusion are particularly salient to contract-appointed faculty. Resource adequacy is also of particular relevance to contract-appointed faculty members who have experienced limited resources in the

form of office space and professional development (Kezar and Maxey, 2014). Given the relevance of Kalleberg's (1977) work dimensions to the work experience of contract-appointed faculty members as documented in the literature, these work dimensions are a logical fit for the theoretical framework for this study.

Organizational Justice. Perceptions of organizational justice have received limited attention in the higher education literature, but provide an appropriate addition to the theoretical framework that will be used for this study. Cropanzano et al. described organizational justice as “the ‘glue’ that allows people to work together effectively” and as defining “the very essence of individuals’ relationship to employers” (2007, p. 34). Justice perceptions and trust assessments consistently predict employee attitudes and behaviors (Colquitt and Rodell, 2011), so are relevant when considering contract-appointed faculty perceptions of the work environment. It has also been established that distributive justice and procedural justice have a strong relationship to job satisfaction, while interpersonal and informational justice have a moderate relationship (Greenberg, 2011). The three components of justice that will inform this study include distributive justice, procedural justice, and interactional justice, which encompass both interpersonal and informational justice.

Distributive justice. Distributive justice has been described as feelings of fairness relating to the distribution of resources (Roch and Shanock, 2006), often in comparison to resources received by another (Greenberg, 2011), and concerns the fairness of outcomes in relation to inputs (Colquitt and Shaw, 2005). Distributive justice relates to the equity of outcomes, such as the fairness of resource distributions that may include pay, rewards, and promotions (Colquitt and Shaw, 2005). Cropanzano and colleagues describe three allocation rules that can lead to distributive justice including: “equality (to each the same), equity (to each in accordance with

contributions), and need (to each in accordance with most urgency)” (2007, p. 37). Equity is often used to allocate rewards for high performance, whereas equality builds team cohesion. Given that research faculty often have similar inputs, or academic credentials (Ph.D.) and length of training as their tenured or tenure-track colleagues, distributive justice rules may be relevant to determinants of job satisfaction for this group.

Procedural justice. Procedural justice relates to the perceived fairness of processes that lead to outcomes. This may include opportunities to provide input in the decision-making process, consistency across people and time, and accuracy based on valid information (Greenberg, 2011). Procedural justice is concerned with the process by which outcomes are allocated and affects how individuals feel about the organization as a whole (Cropanzano et al., 2007). Procedural justice is captured by the fairness of decision-making procedures that lead to an outcome (Colquitt and Shaw, 2005).

Core attributes that make procedures just include: “Consistency: All employees are treated the same; Lack of Bias: No person or group is singled out for discrimination or ill-treatment; Accuracy: Decisions are based on accurate information; Representation of All Concerned: Appropriate stakeholders have input into a decision; Correction: There is an appeals process or other mechanism for fixing mistakes; and Ethics: Norms of professional conduct are not violated” (Cropanzano et al., 2007, p. 36). When procedures are perceived as just, employees are more likely to exhibit greater loyalty and are more likely to behave in the best interests of the organization. (Cropanzano et al., 2007). Contract-appointed faculty members have expressed a need for more specific and transparent policies concerning their employment (Waltman et al., 2012), and a department culture that does not have policies or practices in place for contract-

appointed faculty members has been shown to have a negative impact on performance (Kezar, 2013b).

Interactional justice. Interactional justice simply relates to how one person treats another (Cropanzano et al., 2007). Interpersonal justice consists of treating others with dignity and respect, and informational justice requires clear and thorough explanations about procedures used to determine outcomes (Greenberg, 2011). Respect has been captured in the organizational justice literature as an element of interpersonal justice when employees are treated with dignity and respect when decisions or procedures are enacted (Colquitt and Rodell, 2011; Colquitt, LePine, Piccolo, Zapata and Rich, 2012; Colquitt, Scott, Rodell, Long, Zapata, Conlon and Wesson, 2013). Just treatment is an indication that an individual is respected by a larger group (Cropanzano et al., 2007).

Interactional justice can be split into two subcategories of interpersonal and informational justice. Core attributes of interactional justice include: “Interpersonal justice: Treating an employee with dignity, courtesy, and respect” and “Informational Justice: Sharing relevant information with employees” (Cropanzano et al., 2007, p. 36). Based on theories of job satisfaction and motivation, Gappa and colleagues identified respect as a “fundamental entitlement for every faculty member,” and “which underlies all institutional efforts to provide an academic work environment that stimulates personal and institutional growth and success” (2007, p. 139). Perceptions of respect and collegiality may reflect the presence or lack of interactional justice in the work environment.

The experience of research faculty with respect to organizational justice across each dimension may be an indication of the presence or lack of respect in the institutional environment. Considering that justice perceptions have an impact on job performance, such as

task performance, citizenship behavior, and counterproductive behavior (Colquitt, et al., 2012; Roch and Shanock, 2006; Lind and van den Bos, 2002) it is also important to consider how research-track faculty perceive justice in their work environment.

Organizational justice and job performance. Justice literature confirms that justice perceptions have an impact on job performance and organizational citizenship behaviors (Moorman, 1991; Roch and Shanock, 2006). Organizational citizenship behaviors (OCBs) have been defined as “job-related behaviors which are discretionary, not formally recognized by the organizational reward system, and, in the aggregate, promote the effective functioning of the organization” (Moorman, Niehoff, and Organ, 1993, p. 210). Perceptions of fairness have been identified as essential to the development of faith and trust that are needed for employees to exhibit OCBs (Moorman et al., 1993). Understanding how research faculty perceive their work environment can lead to efforts to improve how fairness is perceived in the work environment. Perceptions of fairness encourage extra activities that benefit the institution, and could include examples such as: spending time to mentor a newer colleague, proof reading a colleague’s grant application, and collaborating with others on multiple grant applications, all important aspects of an academic researcher’s work.

In the context of the research environment where scientists engage with others, perceptions of justice have been described as “evidence of favorable working conditions and environments” (Martinson et al., 2010, p. 67). Scientists who perceive a just environment have been found to report more positive behaviors and less incidents of misconduct (Martinson et al., 2010). Martinson and colleagues noted that fair treatment of researchers is an important factor in influencing normative behaviors. Ensuring fairness in the decision-making process at the

department level with transparency and collegial buy-in can work toward providing a just environment for researchers (Martinson et al., 2010).

Research-track faculty members constitute a growing segment of the faculty in higher education. To ensure continued excellence and optimal performance, institutions of higher education must make an effort to understand and address the needs of all members of the faculty. Understanding how research-track faculty members experience their work environment in an institution with developed policies and practices specific to this faculty group may provide valuable insights to institutions that wish to develop or re-consider their own policies and practices to best support these faculty members. Analyzing the data that is generated from this research study utilizing Kalleberg's (1977) job satisfaction framework will highlight the subjective nature of job satisfaction, which research-track faculty members will address in their own words during interviews. The organizational justice component of this study's theoretical framework will facilitate identification of research-track faculty members' stated experiences that confirm or deny perceptions of fairness in the workplace, which can also be influential to job satisfaction.

CHAPTER 3

Methodology and Methods

The purpose of this qualitative study was to understand how research-track faculty experience their work as research-track faculty in a doctoral institution with a Carnegie classification of highest research activity. To organize the data, I developed a conceptual framework incorporating job satisfaction and organizational justice concepts. In basic qualitative research, the researcher seeks to understand what meaning people attribute to their experiences including how they interpret their experiences and construct their worlds (Merriam and Tisdell, 2016). Through this study I sought to understand what factors contribute to research-track faculty's perceptions of job satisfaction or dissatisfaction and organizational justice in their work environment.

Methodology. I pursued this study from a social constructivist worldview, which considers that individuals develop meaning of their experiences subjectively (Creswell, 2014). Social constructivists understand that individual views are complex and varied. Further, they focus on the context of life and work in which their research subjects find themselves (Creswell, 2014). Social constructivists follow an interpretivist perspective, where there is not one truth, but multiple truths, and the researcher attempts to understand a phenomenon from the point of view of a person who has experienced it (Sipe and Constable, 1996).

As I worked to develop an understanding of how research-track faculty experience their work during this research, their perceptions and voice were central. A qualitative research design provides a means of studying meaning that individuals ascribe to a given issue or problem (Creswell, 2014). Qualitative researchers seek to understand how people make sense of their lives and how they interpret their experiences (Merriam and Tisdell, 2016). A qualitative design

was an appropriate methodology to develop an understanding of how research faculty experience their work.

Research Design

Pilot Study. Before obtaining approval from the Institutional Review Board and prior to initiating research, I conducted a pilot study to test my protocol. I identified several individuals at my institution who either were currently or had previously been research-track faculty. Two people agreed to participate in two semi-structured interviews each. My original protocol was separated into two equal sessions of one hour each.

After conducting the pilot interviews, I found that one hour was too much time to cover half of the questions, and too little time to cover all of the questions. I adjusted the protocol to include up to 1.5 hours for the first interview and up to thirty minutes for the second interview. This structure allowed me to cover all questions during the first interview, and during the second interview to complete an illustration activity, and to follow up on any questions or insights that came about from the first interview after preparing and reviewing the transcript.

Institutional Review Board. Prior to initiating research for this study, I submitted an initial application for exempt status to the Human Research Protection Program at Michigan State University along with my revised study protocol. Upon review of the study details, the Institutional Review Board deemed this project to be exempt in accordance with federal regulations.

Context. The increase of research-track faculty in higher education is a relatively recent phenomenon. It can be difficult to identify contract-appointed faculty because their presence is often difficult to track. Contract-appointed faculty members often have inconsistent titles; they are sometimes appointed at the department level with minimal or no involvement from central

administration; and they are often dispersed among different departments such that contract-appointed faculty members are often not aware of the existence of others with the same appointment type (Bergom, Waltman, August, and Hollenshead, 2010).

The National Science Foundation collects data annually from institutions of higher education, including counts of non-faculty research staff consisting of all doctoral scientists and engineers whose primary responsibility is research, but who are not considered to be either postdoctoral appointees or members of the regular faculty. Institutions that voluntarily provide counts of non-faculty research staff to the National Science Foundation most likely have a mechanism of tracking this faculty group, and likely also have a general understanding of how many in this group are present on their campuses. In 2016, institutions of higher education in the United States reported the presence of 25,292 non-faculty research staff on their campuses (National Science Foundation, 2018).

The site I selected for this study is an R1 doctoral university with the highest level of research activity. The pseudonym I assigned for the research site is MedU. The count of non-faculty research staff this institution reported to the National Science Foundation in 2016 is among the highest, ranking in the top ten of over 250 reporting institutions (National Science Foundation, 2018). The institution's own statistics indicate that as of 2014, 336 research faculty were employed at the institution in the medical school. This institution has used a research-faculty track for the past several decades including a track for research scientists and a track for research professors.

The National Science Foundation recently reported that MedU has among the highest level of research expenditures of all reporting higher education institutions in the United States in fiscal year 2016 (National Science Foundation, 2018). MedU has a robust research environment,

as well as established written policies and procedures concerning appointment and promotion for research-track scientists and professors. These policies and procedures are publicly available. I have provided definitions from the 2018 MedU Faculty Handbook below.

Research-track faculty definitions. The 2018 MedU Faculty Handbook provides definitions for the research track in general, and for research track faculty specifically, including the research scientist track and the research professor track.

The general definition for Research-Track faculty is as follows:

The Research Track began in 1974 and has two pathways; the Research Professor Track and the Research Scientist Track. The research investigator rank lies in the Research Scientist Track. Promotion beyond this rank ascends through the research professor or research scientist pathway. As the titles indicate, Research Track faculty members have a predominant commitment to the research arena. There is a mandated ascension in rank (four years for the research investigator and six years for the research assistant professor and assistant research scientist). Such ascension reflects achievements in research. Faculty members in the Research Professor Track are engaged in teaching missions within the context of research programs in the Medical School.

The research scientist track is defined as follows:

The Research Scientist Track in the Medical School consists of four ranks: Research Investigator, Assistant Research Scientist, Associate Research Scientist, and Research Scientist. Research Scientist Track faculty actively contribute to the Medical School's research mission. Research Scientist Track faculty

appointments are intended for individuals whose primary activity is research; either in a team science/co-investigator role or as an independent scientist.

The research professor track is defined as follows:

The Research Professor Track in the Medical School consists of three ranks: Research Assistant Professor, Research Associate Professor, and Research Professor. Research Professor Track Faculty actively contribute to the Medical School's research and teaching missions. Research Professor Track faculty appointments are intended for individuals whose primary activity is research; and who also teach and mentor within the context of research in the Medical School. Substantive curricular teaching for Research Professor Track faculty may be reflected in a fractional appointment in another track.

These definitions provide helpful context and background information when considering how research faculty members experience their work.

Sample Selection and Recruitment. Given the topic of this research study, the study sample was purposeful. Purposeful sampling is appropriate when a population includes people from whom the most insights can be obtained and the most can be learned (Merriam and Tisdell, 2016). Purposeful sampling is also suitable when a particular site or participant can best help the researcher understand the research question at hand (Creswell, 2014). The chosen research site has an environment with existing written policies and practices for an established research-faculty track. Choosing this site facilitated identification and inclusion of participants in the study who have experiences that are highly relevant to the research questions. Participation in the study was open to research-track faculty members who have been appointed in this role for a minimum of one year within the biomedical sciences at the research site. I limited participation

to research-track faculty in the biomedical sciences in the institution's medical school to minimize differences that could be present due to varying disciplinary norms.

To identify potential participants for this study, I obtained names of research-track faculty members along with contact information by reviewing publicly available institutional directories on-line. I decided in advance that it would be important to interview researchers from both research scientist and research professor faculty tracks because the two tracks have different expectations. I believed that the work experience of members of these two different faculty groups, though similar in appointment type, could be different. I also decided to exclude the first level of research faculty appointment, the research investigator, because this role is a shorter-term role that immediately follows postdoctoral training. Assistant research scientists and research assistant professors have already advanced through the research investigator appointment, thereby having more experience in the research track at the institution.

The research site has nine basic science departments and twenty clinical departments. After reviewing the websites for the basic science and clinical departments, I selected seven basic science departments and two clinical departments within the medical school at the research site from which to recruit participants. I eliminated two basic science departments, one that was joint with the college of engineering, and the other that focused on the science of learning rather than on the biomedical sciences. Given the requirement that research faculty obtain funding to support their salary, I thought it was important to include departments where research faculty pursue funding from similar sources related to human health, such as through the National Institutes of Health and disease specific nonprofits and foundations. Based on my experience with biomedical research funding and sponsors, I believed that the external funding environment would likely play a role in how research faculty experience their work.

Among the twenty clinical departments at the research site, eight either had no directory available, or no contact information available for research faculty. Seven clinical departments had two research faculty or less in the directory. For recruitment purposes, I selected two clinical departments that had fifteen research faculty listed in the on-line directory for each department.

I identified sixty-three research faculty members of which thirty were research professors and thirty-three were research scientists. Overall, I contacted twenty-nine research professors and thirty-three research scientists. One research professor had incorrect contact information and could not be reached. Table 1 below provides details concerning participant recruitment efforts. I masked department names to protect the identity of the participants.

Recruitment Response						
Department	Research Professors Contacted	Research Professors Recruited	Research Professors Excluded (Agreed to participate but eliminated)	Research Scientists Contacted	Research Scientists Recruited	Research Scientists Excluded (Agreed to participate but eliminated)
Biomed Sci 1	5	1	0	4	0	1
Biomed Sci 2	2	2	0	1	1	0
Biomed Sci 3	4	2	0	2	0	0
Biomed Sci 4	0	0	0	3	1	0
Biomed Sci 5	3	0	1	3	1	0
Biomed Sci 6	2	0	0	0	0	0
Biomed Sci 7	2	0	0	2	0	0
Clin Sci 1	2	0	0	13	1	0
Clin Sci 2	9	2	0	5	2	0
	29	7	1	33	6	1
Response Rates		24.14%			18.18%	
Total Recruited: 7 Research Professors, 6 Research Scientists						

Table 1: Recruitment Response

Between November 1, 2017 and April 25, 2018, I contacted and followed up with assistant research scientists and research assistant professors via email a minimum of three times each. After calling one person several times until I reached him, and then interrupting him in the lab, I decided against contacting potential participants by telephone to follow-up. Because members of this faculty group often work in a lab without a direct telephone line, a follow-up telephone call can be disruptive to the individual and to others working in the lab. For this reason, I followed up with potential participants via email rather than through telephone calls. I utilized snow ball sampling to recruit participants through suggestions of participating research scientists and research professors. However, this technique was not effective and did not result in recruitment of additional participants.

During the recruitment period I recruited six assistant research scientists and seven research assistant professors from nine different departments. All participants had a rank at the assistant research scientist or research assistant professor level. I recruited one additional research professor and one additional research scientist, each of whom I eliminated from the study results. The research professor had a rank at the level of full professor. It was clear that his appointment was temporary to fill a specific need in the department. He was brought into the department from industry to work on specific intellectual property matters. He indicated that as soon as his next industry start-up was off the ground, he would be leaving the institution to pursue those interests. This situation put this research professor in a category separate from the other participants. The assistant research scientist I eliminated did not have enough experience to provide meaningful input for the study. During the interview I determined that he had less than 12 months of experience in his assistant research scientist position. The names of the departments have been masked and numbered.

Participant Demographics. Assistant research scientists recruited were primarily male with one female recruited. The age range of assistant research scientists varied with three participants being over forty-four years of age and under fifty-five years of age, one assistant research scientist fitting the age range category from over thirty-five and under forty-five years of age, one research scientist being over fifty-four years of age and under sixty-five years of age, and one research scientist who did not disclose his age range due to his failure to participate in the second interview. I randomly assigned a pseudonym for each participant to protect their identity.

Research assistant professors recruited were also predominantly male with six males and one female recruited. Three research assistant professors were within the age range of forty-five to fifty-four and two were in each of the age ranges of thirty-five to forty-four and fifty-five to sixty-four. I also randomly assigned a pseudonym for each research assistant professor. I prepared a password protected Excel document with contact information and the pseudonym assigned for each participant to maintain the anonymity of the participants.

Pseudonym	Gender	Age Range	National Origin
Scientists			
Graham	M	45-54	Europe
Jay	M	55-64	North America
Trace	M	45-54	North America
Eric	M	35-44	South/Central America
Sam	M	Did not disclose	South Asia
Lisa	F	45-54	Asia
Professors			
Dan	M	55-64	North America
Brad	M	35-44	Canada
Marc	M	45-54	South/Central America
Karen	F	45-54	Canada
Jason	M	55-64	North America
Dave	M	45-54	North America
Charles	M	35-44	North America

Table 2: Participant Demographics

Data Collection Procedures

Individual Interviews. To pursue this research inquiry, I conducted open-ended semi-structured individual interviews. Interviews that follow a less-structured format are suitable for situations where participants define the world and their experience in unique ways (Merriam and Tisdell, 2016). The in-depth interview is a data collection strategy that captures the “deep meaning of experience in the participants’ own words” (Marshall and Rossman, 2006, p. 55). I conducted interviews with six assistant research scientists and seven research assistant professors working in biomedical sciences at the research site. I requested permission to audio-record the interviews. Each participant, with the exception of one assistant research scientist who requested not to be audio-recorded, signed a written consent document providing permission for me to audio-record the interviews.

Overall, I conducted two face-to face interviews with eleven of thirteen participants, the first being up to 1.5 hours and the second interview lasting up to approximately one half an hour. One assistant research scientist did not return my email requests for the second interview. An additional assistant research scientist requested not to be audio-recorded. Given that her first interview took less time than the prescribed 1.5 hours, and there would be no formal transcript to prepare, I completed the second interview during the same interview session.

The first interview included a list of questions and probes allowing the participants to freely express their ideas and opinions in their own words. The protocol is located in the appendices as Appendix C. The interview questions were open-ended and covered the participant’s career path to their current position, a description of the participant’s position, role, and duties, a question about what brought the participant to the institution, a request to describe the work environment including space and colleagues, and also a series of questions that derived

from the conceptual framework which sought to elicit the participants' conceptions of their work relating to dimensions of job satisfaction and organizational justice. Memos provide an opportunity to reflect on and further develop the data (Saldaña, 2016). Immediately after each interview, I prepared a reflexive memo to record my impressions and thoughts of the interview.

To prepare for the second interview, I transcribed the audio-recording of the first interview in advance. Transcribing each audio recording myself brought me closer to the data as I spent significant amounts of time listening to the interviews and transcribing the contents word for word. I included time references from the audio recordings in the transcripts so that specific quotes could be located and reheard as desired.

This process also provided an opportunity for me to think about the data throughout its collection over the several months during which interviews were taking place. Prior to the second interview, I reviewed the final transcript and identified any potential areas that would be helpful to re-visit to confirm my understanding or obtain additional details during the second interview. I brought a copy of the transcript with me to the second interview. I gave participants the opportunity to review the transcripts if desired, and to keep the copy for their records. At the beginning of the second interview, I asked each participant to complete a demographic questionnaire including with which gender the participant identified, their age range, and current or previous region of citizenship if a naturalized American citizen.

The second interview consisted of a visual portrayal activity. For that activity, I asked the participants to sketch or draw a visual representation of their work including on one side of the page aspects of their job they liked best, and on the opposite side aspects of the job that they liked least, or that were less favorable. Some participants attempted to make drawings; however, all preferred to use words to list the positive and negative aspects of their work on paper. These

lists provided an excellent source from which to confirm my understanding of participant viewpoints expressed during the first interview.

Document Collection and Website Review. I collected documents from the research site's website, including the 2015 Faculty Handbook and the Medical School Bylaws revised in April 2012. I reviewed sections that are applicable to research-track faculty to familiarize myself with institutional definitions, expectations, and bylaws prior to conducting interviews with participants. I re-visited these documents again after the interviews were completed. I found that the Faculty Handbook had been revised again in May 2018. After comparing the 2015 version with the 2018 version I found that key definitions concerning research-track faculty were unchanged. Having an understanding of the contents of the university's handbook and bylaws pertaining to research faculty was helpful background information when conducting interviews. The institution's website through the faculty affairs and faculty development offices also includes detailed information about research track career success, career stages, and skill development, which I reviewed on MedU's website and have included in my data analysis.

Data Analysis

Data analysis began at the beginning of the study and continued throughout so that early analysis could inform future data collection as needed. I printed a hard copy of all transcripts after completion and placed them in a dedicated notebook along with corresponding reflexive memos. I immersed myself in the data throughout the data collection process by transcribing each transcript word for word prior to the second interview with each participant, and throughout data analysis by reading through all data collected multiple times. I looked for patterns and themes for future reference as I worked through the data. I made notations in the margins of each

transcript after reviewing the text. I revisited the purpose of my study and my research questions to keep my review of the data targeted.

I used coding as a strategy to manage my data (Merriam and Tisdell, 2016). A code is “most often a word or short phrase that symbolically assigns a summative, salient, essence-capturing, and/or evocative attribute for a portion of language-based or visual data” (Saldaña, 2016, p. 4). Coding allows data to be organized through groupings to converge and explain meaning (Saldaña, 2016). I completed initial coding and data analysis manually to ensure that I was closely familiar with and connected to the data.

As a first step, I read each transcript and wrote notes and reflections in the margins. Saldaña (2016) suggests pre-coding by circling, highlighting, or marking using different colors to identify rich sections of text. I used eight different colors to highlight sections of the transcript that fit into various potential themes I had identified, including:

1) environment/resources/governance; 2) funding/grant submission eligibility/security; 3) role; 4) path/ seeking/teaching; 5) quality of life; 6) nature of work; 7) promotion/advancement/career; and 8) relationships/colleagues. To further facilitate analyzing and organizing the data, I wrote notecards with a topic on the front and notes on the back. I grouped the notecards by topic to identify themes based on the collection of cards that emerged on a given topic. The patterns I identified in the data were guided by my theoretical framework. In identifying patterns and themes, I was mindful of work values participants expressed that reflected determinants of job satisfaction or dissatisfaction. I was also consciously aware of thoughts or statements that could be related to organizational justice concepts. I also noted themes that did not align with the job factors or organizational justice but were relevant to the work experience of research faculty, such as research faculty roles and experience with governance.

To make my data more manageable, I also employed in vivo coding. In vivo codes derive from the participants' actual statements and honors their voices (Saldaña, 2016). For in vivo coding, I reviewed each transcript and used colors to highlight participant quotes. I then confirmed the themes to which each quote was attributed to develop codes based on participant quotations which prioritized the participants' voices.

I created a codebook for assistant research scientists and a codebook for research assistant professors to record themes and to capture and track the codes, their descriptions, and brief examples to use for reference. Themes should be responsive to the purpose of the research (Merriam and Tisdell, 2016). I used my theoretical framework as a guide as I created the list of themes and codes that emerged from reviewing individual transcripts and memos. However, I was receptive to the emergence of themes that did not fit within the work value factors present in the theoretical framework. I labeled each transcript with the participant's pseudonym, and I included page numbers as well as the interview date or sequence being one or two so that details in the transcripts could be easily recorded and retrieved later as needed. In the transcripts, I included time references from the audio recordings to facilitate retrieving and re-listening to participant quotes as desired.

I engaged in document and website analysis to review established policies that pertain to research scientists and research professors. It is important to have an understanding of existing policies to consider whether the data obtained through the interviews substantiate or contradict written policies. A mismatch between written policies and enactment of these policies could have implications for participant perceptions of procedural justice, a relevant component of the theoretical framework for this study. I also completed an analysis of a faculty affairs and

development website which provided details about strategies of success for those on the research track.

Trustworthiness and Rigor

To ensure trustworthiness I triangulated the data and used thick, rich descriptions. Triangulating the data involves bringing multiple sources of data together to bear on a single point (Marshall and Rossman, 2006), and using multiple methods of data collection (Merriam and Tisdell, 2016). Data collected from different sources should be compared and cross-checked (Merriam and Tisdell, 2016). I gathered data from multiple sources by conducting interviews during two separate timepoints, and by reviewing documents as well as the MedU website. I cross-checked the interview data with the data that derived from the document and website review by making comparisons between the two.

I used multiple methods of data collection by collecting data through interviews, through an illustration activity during the second interview, and by document and website analysis. The illustration activity was particularly helpful for confirming and cross-checking my data. I was able to confirm my understanding from the first interview, and obtain additional data as needed after preparing and reviewing the transcripts from the first interview. Collecting data without the need to involve participants is considered an unobtrusive measure, and an additional effective triangulation strategy (Marshall and Rossman, 2006). To undertake document review, I obtained documents from the medical school website such as the medical school bylaws and faculty handbook. I also reviewed the institution's website pertaining to research track appointments and career development. Reviewing the documents and the website provided additional data that I considered in light of the data I collected from the participants during the interviews.

An additional method I used to ensure trustworthiness of the data was to use thick, rich descriptions to provide detailed accounts from participants about their experience as research scientists and research professors. A thick, rich description can include a description of the setting, participants of the study, and a detailed description of the findings using quotes from participant interviews (Merriam and Tisdell, 2016). I prepared a brief bio for each participant, and in my analysis I included detailed quotes from participants, which I obtained through the individual interviews that I had audio-recorded and transcribed. To further validate my data, I engaged in member checking by sending all statements and quotes I attributed to each participant to each person to review. I gave each participant ten days to respond with feedback. One participant requested minor revisions to his quote to make the language more clear. A number of other participants confirmed that they were in agreement with my understanding and interpretation of their interview. I did not receive feedback from any participants objecting to my interpretation of their statements and quotes that derived from my interviews with them.

Because I have worked in research administration for a number of years, and because I have read an abundance of literature that focuses on negative working conditions of contract-appointed faculty, I was deliberate about listening to the participants' viewpoints without the interference of my own preconceived ideas or expectations. I approached the data with an open mind with the goal of conveying the researchers' experience as research-track faculty with their voices and perceptions conveyed authentically untainted by my potential biases.

Reliability is the extent to which there is consistency in the findings (Merriam and Tisdell, 2016). Reliability is enhanced when the researcher explains the assumptions and theory that inform the study, by triangulating data, and by describing in detail how the findings were derived from the data, also described as leaving an "audit trail" (Merriam and Tisdell, 2016).

Data triangulation I described above contributed to the reliability of this study. To develop an audit trail, I documented the procedures I followed for collection of data for the study. I developed an Excel workbook with contact information of all potential participants, their contact information, and date of contact, as well as a separate tab in the workbook that includes the names and contact information of all participants who were recruited. The Excel sheet is a password protected file to protect the anonymity of the participants. I maintained electronic copies of all audio-recordings and the respective transcripts which are labeled by participant pseudonym and date. For the audit trail, I also labeled each reflexive memo by pseudonym name and date written. All printed transcripts and reflexive memos were also collected in a binder for reference and analysis.

For document analysis, I relied on the last revised dates on these documents to confirm the version I used. After the study was underway, the 2012 medical school bylaws were revised in May of 2018. I reviewed the most recent version for changes and used the updated version for data analysis. For the website review, I printed the pages that I reviewed from the website, which include a date and timestamp on the first page.

Positionality

As I have worked in research administration, I have mostly worked with faculty members appointed on the tenure-track. However, I have had occasion to work with contract-appointed faculty members pursuing research funding to maintain their positions. I have observed specific instances where contract-appointed faculty positions were eliminated due to lack of funding resulting in people I knew losing their jobs. As a doctoral student, I read much literature that highlighted inadequate working conditions experienced by contract-appointed faculty members which scholars have identified as a hindrance to optimal performance.

A researcher's positionality is characterized by biases he or she brings to the study, and beliefs and life experiences that he or she may project onto the data (Merriam and Tisdell, 2016). It was my goal to approach this study with an open mind with no preconceptions of the circumstances or desires of the research-track faculty members who participated in the study. Given my experience, there was a potential for me to make assumptions about research track faculty positions being less desirable than tenure-track positions and to impose beliefs about potential negative working conditions for this group onto the data. I strived to hear the voices of the study participants to gain a better understanding of what their motivations were for choosing this career path, and to hear how they experienced this role. I made a conscious effort to rely on the participants themselves and not on my past experiences or assumptions when considering and analyzing the data.

Limitations

This study was not without its limitations. Even though MedU has over three hundred research-track faculty appointed in the medical school, I only identified sixty-three research track faculty who could potentially be participants in the study. I did not include research investigators in recruitment, which accounts for some of the research-track faculty that were not included in the total count of people I identified. The participants recruited also did not represent the overall percentage of women in research track appointments at the institution. In 2015, MedU reported that the research track was comprised of 37% women in 2014. Participants in this study include one woman from the assistant research scientist track and one woman from the research assistant professor track. Out of the number of individuals recruited, women represented 16.7% of assistant research scientists and 14 % of research assistant professors. Therefore, women were

underrepresented among the participants in this study given the overall population of women in the research track at MedU.

Summary

To develop an understanding of how assistant research scientists and research assistant professors experience their work, I conducted a basic qualitative study from a social constructivist worldview. I used a theoretical framework combining Kalleberg's (1977) six dimensions of work values and three components of organizational justice defined by Cropanzano, Bown, and Gilliland (2007) to guide my data collection and analysis. To complete the study, I recruited six assistant research scientists and seven research assistant professors from the medical school of a research university with highest research activity with developed policies and practices specific to research-faculty. With the exception of two assistant research scientists who participated in one interview, all participants participated in two face to face interviews. I also completed document review and website analysis to complete the data collection for this study.

To analyze the data, I used coding strategies such as pre-coding, coding, and in vivo coding to identify and confirm themes in the data I collected. To ensure trustworthiness and rigor, I used triangulation strategies such as using thick, rich descriptions in the findings, and multiple data collection methods and sources of data. I also engaged in member checking to confirm the validity of the data from the participants directly.

CHAPTER 4

Study Participants

The purpose of this qualitative study was to develop an understanding of how research track scientists and professors working in biomedical sciences in the medical school of a research university with highest research activity experience their work and role as research faculty. Below I have provided brief biographical information concerning each participant including details about the path the participants followed to a research track faculty position. This background information, including information about the goals and aspirations of the participants, can help the reader to better understand these research-track faculty members as individuals.

Participant Biographies: Assistant Research Scientists.

Graham. Graham completed his Ph.D. in Europe. After completing his doctorate, the financial climate in his home country was difficult. After working in his home country for a short time, Graham came to the United States as a visiting scholar to MedU. After working for a few years, Graham completed additional postdoctoral work in the Southern United States, but ultimately, he came back to MedU for family reasons. While his extended family is still back in Europe, his wife has ties to the community where MedU is located. When a biodefense grant was funded, Graham accepted a job offer to return to MedU as a research investigator, an entry level position on the research track. Graham desires to balance his responsibilities with his home life and does not aspire to have a tenure-track position.

Jay. Jay retired from a military career prior to entering graduate school. He completed his Ph.D. at MedU. MedU provided an appealing program in Jay's scientific area of interest including a faculty member with whom he wished to work. Jay was a resident of the state where

MedU is located, and he had extended family in the area, so choosing MedU to complete his studies made sense. Jay was not interested in pursuing a tenure-track position in academia. His expectation was that he would become a staff scientist. Jay's goals were to do research and to have a work-life balance that would be appropriate for him as a second career.

Trace. Trace came to MedU to complete postdoctoral training after completing his Ph.D. in North America. Trace put off making career decisions at first because he wasn't sure exactly what he wanted to do. He immersed himself in the work publishing and doing research. Ultimately, when Trace decided that he would like to pursue a career in academia, the funding available from the National Institutes of Health had significantly declined. Funding in the lab dried up, and Trace found himself as one of the few people remaining in the lab. Once Trace's eligibility to apply for grants as a postdoctoral trainee expired, it was difficult for him to seek his own funding. At the same time, because funding was tight, Trace could not be promoted to the research faculty track which would require a mandatory 10% raise. Trace was delayed several more years until he was able to transition to a research-track faculty position that would allow him to pursue his own funding. Trace's career goal is to obtain a tenure-track position where he can have his own lab and students.

Eric. Eric is a physician from Central/South America. He completed rotations in the United States and Canada. After returning to his home country, he was recruited back to MedU as a research fellow. After a couple of years, he transitioned to a research-track faculty position. Eric's original career goal was to be a surgeon. Eric's fascination with how research is done at MedU and the link between what can be done in the future on the clinical side through experimental models prompted his career goals to change. Eric sees himself as a link between

professors and clinicians. He acknowledged that tenure would provide security, but he did not indicate that this is a career goal. Eric's goal is to be able to continue to do the work he is doing.

Sam. Sam is from South Asia. He completed his Ph.D. in his home country and then came to the United States to do his postdoctoral training. When the PI of the lab where he was working did not get his grant renewed, Sam came to MedU to complete additional postdoctoral training. Sam was gradually promoted from postdoctoral fellow to research investigator, and then to an assistant research scientist. Sam would have liked to stay in his home country to teach, but came to the United States because it was his wife's dream to come. She also works as research faculty at MedU. It is Sam's goal to obtain independent funding so that he can find a tenure-track position at another institution and become an independent scientist.

Lisa. Lisa is a physician from Asia. She practiced medicine for ten years prior to coming to MedU. Lisa was recruited to come to MedU at an international conference. She was interested in doing research and in coming to the United States. When she arrived, research funding was strong; however, soon after the Great Recession caused the funding climate to deteriorate. Lisa witnessed her boss lose all of his grant funding. Lisa's current boss has a lot of funding. However, Lisa feels that compensation is not good in her position, and her job is not secure. Lisa doesn't feel a need to do her own independent research. Even though Lisa enjoys doing research, she regrets changing careers and would go back to being a physician if she could.

Participant Biographies: Research Assistant Professors.

Dan. Dan completed his Ph.D. in the 1980's in North America. At the time, he was interested in obtaining a tenure-track faculty position, however, funding was tight and Dan had changed fields. He didn't feel that he had the number and caliber of publications needed to land a tenure-track job. Dan pursued a career in industry instead, and he worked for a pharmaceutical

company for over 20 years. The company he worked for was acquired by another company. He was then transferred out east where he worked for four years before returning to the community where MedU is located. His wife had a good job at MedU, so she did not want to relocate. Dan reached out to a colleague at MedU whom he knew well to see if she would be interested in having a well-trained researcher in her lab. He started as a postdoctoral researcher in her lab, and then was promoted to a research investigator before being promoted to a research assistant professor. Dan's colleague is currently the chair of his department.

Brad. Brad completed his Ph.D. in North America. His goal was to earn a Ph.D. and then to go to medical school to become a physician scientist. Ultimately, Brad's career goal was to become a faculty member and to have his own lab. However, opportunities to attend medical school in his home country were very limited. By the time Brad was accepted into medical school, he had to decline the offer for family reasons. He accepted a postdoctoral position instead so he could care for an ill parent. After completing a portion of a second postdoctoral appointment, Brad was recruited to MedU. He interviewed for his position along with two or three other people. Even though Brad was able to successfully negotiate for a tenure-track position at MedU, his boss discouraged him from accepting a tenure-track appointment due to the high bar required to obtain tenure at MedU. Instead, Brad agreed to accept a research-track position with the understanding that a request would be made to switch tracks after a couple of years. Brad has a lot of respect for his boss and is following his recommendations.

Marc. Marc is a medical doctor from Central/South America. His original career goal was to be a surgeon. However, he wished to complement his surgical practice with research activities. Marc came to MedU to complete research training. After completing a two-year training program, Marc was hired as a research investigator and then promoted to a research

assistant professor five years later. Marc decided not to return to his home country because the quality of life in his home country is very poor, and work-life balance as a surgeon was very difficult. Marc had requested a tenure-track position at MedU, but he was not offered a tenure-track position. Instead, he followed MedU's recommended career path as research faculty.

Karen. Karen completed her Ph.D. and started working with her boss when he was the PI in the lab at another institution. Karen does not have ambitions to have her own lab. She enjoys doing bench research and wanted a career where she could do this. When her boss re-located to MedU, he asked Karen if she was interested in moving as well. MedU is located in close proximity to Karen's extended family, so MedU's location was also appealing to her. If Karen's boss had chosen to re-locate to the west coast, she would not have joined him, though they work very well together.

Jason. Jason had about fifteen years of work experience between completing his undergraduate degree and attending graduate school, so he is a little bit older than other people in his career stage. After completing his Ph.D. in North America, Jason's career goal was to teach math at a community college. However, his professor suggested that he try a postdoctoral research appointment instead. During this time, Jason discovered that he loved research, and that the environment was very family friendly. He completed 2 ½ to 3 years of an additional postdoctoral research appointment. His career goal changed to obtain a tenure-track faculty position. However, Jason felt that his age was working against him. Jason was recruited to work with a colleague of one of his postdoctoral mentors where he was hired as a research scientist and then promoted to an assistant professor position. That institution did not have tenure-eligible positions because it was solely a medical school. Ultimately, Jason moved with the PI of the lab

when the entire lab was recruited to MedU. Even though Jason enjoys his work, he would take a tenure-track faculty position if one became available.

Dave. Dave obtained his medical degree in Asia, and then he finished his Ph.D. studies and postdoctoral training in North America. Dave switched postdoctoral positions partway through his training because he didn't have good chemistry with the PI. He feels that making this switch was a setback for his career. He was recruited as a Research Investigator at MedU at the same time when his wife was hired as a tenure-track faculty member. Dave does not have any interest in teaching. He focuses solely on research, which he enjoys. Dave would like to be able to obtain his own independent research funding, but he has not expressed a desire to obtain a tenure-track position of his own. He expressed that he is making sacrifices to support his wife's career.

Charles. Charles completed his Ph.D. in North America. He returned to MedU to complete his postdoctoral training. Charles wanted to be in the region where MedU is located for family reasons, but acknowledged that completing his postdoctoral studies at MedU was not a good way to establish a career in the region. It is MedU's practice not to hire tenure-track faculty from within the institution. Charles's career goal was to be a scientist and to lead a research team. He thought that he would be able to obtain an independent position at an institution in the region around MedU, but this hasn't happened. After completing his postdoctoral training, Charles stayed on at MedU where he was gradually promoted from a research investigator to a research assistant professor. Charles continues to aspire to obtain a tenure-track faculty position.

CHAPTER 5

Findings

Because the institutional expectations of assistant research scientists are different from research assistant professors, and in light of the third research question for this study which asks how the two groups compare to each other, I analyzed the data pertaining to each faculty group separately being cognizant that many of the themes that emerged from the data from one group would likely overlap with the other. Because one of the research questions posed in this study seeks to compare the experience of the assistant research scientist group with the research assistant professor group, I have kept the two groups separate for purposes of analysis.

Themes		
Assistant Research Scientists		Research Assistant Professors
1.	Role – leading; mentoring and teaching	Role – mentoring and teaching; leading
2.	The work itself – love of research; helping; autonomy	The work itself – love of research; working with students; autonomy
3.	Resources – job security; access to resources; seeking funding and competition; compensation	Resources – job security; access to resources; seeking funding and competition
4.	Career and promotion – job expectations; clarity of promotion process; department or PI support; striving	Career and promotion – job expectations; opportunity for promotion; department or PI support; striving
5.	Collegiality – collaboration; recognition; and external perceptions	Collegiality – collaboration; recognition; and external perceptions
6.	Governance - participation	Governance - participation

Table 3: Final Themes

Themes

I reviewed the data multiple times as described in detail in chapter 3. Because the theoretical framework was used to guide the interview questions, and given that the interview questions were the same for both groups, the themes that emerged were similar. I added subthemes to add clarity and to better define what each theme represented for each group. I identified a total of six themes and eighteen unique subthemes between the assistant research scientist and research assistant professor categories. The first theme, labeled *role*, relates to the

role that research-faculty members play in their work, which sheds light on how these faculty members engage in their work as well as how their role contributes to their experience. The research-track faculty who participated in this study valued doing research, which is reflected in the second theme, *the work itself*. Financial issues have a heightened significance for research-track faculty because members of this group are required to obtain much of the funding that is needed to fund their salaries through grants, whether through independent grants or by collaborating on research projects with others. For this reason, the third theme covers financial aspects of the work of research-track faculty, including the need for and access to resources and is named *resources*. The fourth theme called *career and promotion*, covers career and promotion aspects of research-track faculty work, which ties in institutional expectations detailed in the faculty handbook with pursuit of career goals. The fifth theme concerns relationships research-track faculty members have with others, including relationships with colleagues, department chairs or principal investigators, and external colleagues, including those individuals they interact with at conferences and grant reviewers and is labeled *collegiality*. Lastly, the sixth theme called *governance* covers governance and the opportunity to participate in governance activities, and the decision to either engage or withdraw from the governance process when faced with a choice.

Theme 1: Role. Details about how MedU defines role expectations for research track faculty in the faculty handbook, and also how the participants described their role as research-track faculty members themselves, are helpful when considering whether the faculty experience is congruent with expectations.

MedU defines expectations in the faculty handbook for each rank of all faculty tracks, including instructional, research professor, research scientist, and clinical tracks. Of these tracks,

only faculty appointed on the instructional track are eligible for tenure. I identified two subthemes to the faculty role that are present in the data for both assistant research scientists and research assistant professors including leading, and mentoring and teaching.

Assistant research scientists described a more prevalent role in leading than research assistant professors, while research assistant professors described activities related to teaching and working with students to a greater extent than assistant research scientists.

Assistant research scientists. For the research scientist track, faculty members appointed to this track are expected to contribute actively to MedU's research mission. The research scientist's role is described as primarily research in a team science or co-investigator role, or as an independent scientist. Assistant research scientists who are appointed to this track are expected to have a record of publications in peer-reviewed journals. Assistant research scientists typically participate in professional meetings, and they should demonstrate the potential for scholarly development as part of a larger research program.

Consistent with the expectations articulated in MedU's faculty handbook, each participant confirmed that publishing papers and writing grants are regular responsibilities expected of their position. However, assistant research scientists often also fill a leadership or manager role in the lab. They often take on additional responsibilities, such as mentoring and teaching to satisfy individual professional goals or interests or to meet a need in the lab. The subthemes for the role category include leading, and mentoring and teaching.

Leading. Although the role of the assistant research scientist is described in the faculty handbook as being primarily engaged in research as a member of a team, four of the six assistant research scientists, Jay, Eric, Sam, and Lisa, each described their role as that of a manager or a leader. The assistant research scientists who participated in this study not only engaged in

research as a member of a team, but they took on added responsibility as a leader. These assistant research scientists meet an important need in the lab by leading day-to-day research activities.

For example, Jay described himself as manager of a core facility. There are eight research staff who work in the facility. After starting as a member of the team in the facility as a research scientist, Jay became the director of the facility two and one-half years ago when the director left. Jay spends a significant amount of time managing and leading activities in the facility. Seventy-five percent of Jay's salary is actually covered by his department in support of his administrative role at the facility.

Eric also serves as a leader in the lab within which he works. As he described his role:

I'm right now the manager of the laboratory. So what I do is I partner with clinicians in different fields and I make sure that their research is moving along. And they don't need to be here. So I supervise post doc fellows, I supervise medical students, I supervise various staff group or staff administrative staff. My role is to train . . . the research fellows making sure that we're being productive.

Eric's leadership role reduces the amount of time that other faculty members, such as clinical faculty and instructional-track faculty, need to be present in the lab.

When Sam was asked to describe his current role, he replied: "So I'm doing all maybe you can say I'm the lab manager come everything, . . . so I'm leading everything. I'm planning work, writing paper[sic], writing, everything."

Lisa is also the senior person in her lab of twenty people. She designs research projects, does the experiments, teaches and mentors students and post docs, and she writes papers and grant applications.

Assistant research scientists clearly play an important role in the lab. By serving as leaders, they are actively contributing to the efficiency and productivity of the lab. They are also absolving the principal investigator in the lab of some leadership tasks so they may focus on

additional needs and responsibilities, such as service commitments and teaching in the medical school curriculum. Engaging in mentoring and teaching activities is another way that assistant research scientists contribute to MedU's institutional mission.

Mentoring and teaching. Even though assistant research scientists, according to MedU's faculty handbook, unlike research assistant professors, are not expected to contribute to the institution's teaching mission, members of this group often do engage in mentoring activities, and in teaching activities as well, which support MedU's teaching mission in the context of research. Given that many assistant research scientists have roles that require them to be hands-on in the lab, they have an excellent opportunity to train the next generation of researchers in good laboratory practices and in sound scientific methods, which they readily accept as part of their job. Several assistant research scientists regularly provide mentoring for others in the lab. For example, Lisa mentors students and postdocs in benchwork in the lab, and she trains others in how to do experiments. Eric trains fellows and medical students, and Sam also mentors undergraduate students. Graham also mentors students as part of a multidisciplinary program at MedU. In this capacity, Graham has some students who receive a couple of credits for doing research. Graham meets with those students weekly to discuss a couple of projects.

Part of mentoring others for Graham also meant sharing a funded grant application.

Graham explained:

But if there is a template, and you can follow that template, you are definitely two or three years ahead, and I think that's important. . . . Right now we have Google drive. We have four folders with grants. . . . So they [Ph.D. students] see firsthand how it's [grant application] built, and the example when you see, okay, this is how I should do it, is super helpful.

Trace's mentoring activities were more formal. A student requested that he serve as a mentor for a presentation course. Trace stated:

As it happens this semester, one of my students from the course asked me if I could be their mentor . . . and I didn't know, because . . . I'm maybe faculty, I didn't know . . . what the policy was. So now all of a sudden . . . I'm gonna have multiple students to mentor as well.

Assistant research scientists described having the opportunity to engage in teaching in the classroom if they wished to do so. They had various reasons for deciding to participate in teaching including deriving satisfaction from working with students, and as means of developing their skills for future career opportunities.

Some assistant research scientists enjoy teaching, or find that teaching and working with students is particularly satisfying. When talking about teaching, Jay indicated "I enjoy teaching. I enjoy the interaction with kids. I appreciate that they're graduate students but I still think of them as kids. So I enjoy doing it, and I've kind of kept my eye open for opportunities." However, Jay also explained that he would not want to teach full time. He described teaching as "looking back at stuff that has already been discovered, or you know old information, stuff that's relatively well established, whereas research looks forward, try to figure it out."

An additional reason for teaching is related to preparing for future professional opportunities. A lack of teaching experience can be perceived as a gap in a CV for those who have a goal of landing a tenure-track position in the future. Taking on teaching responsibilities can help fill professional development goals that could lead to securing a tenure-track position elsewhere. Trace described his desire to obtain teaching experience when asked how his teaching responsibilities came about:

So my initial reasoning I think was partly as I was looking for faculty positions and again, you know, I'm trying to you know, I look at my CV and it's like okay, I've got lots of publications, I've got lots of talks, and now I've got a grant. You know the one thing that was missing was teaching. And one of my collaborators is actually the course master for one of the core courses for the Ph.D. program here.

The course master asked Trace to participate as a discussion leader in the course which eventually led to the opportunity to lead a full module for the course when the course master had a conflict. Trace has continued to lead the module. He explained:

You know, he asks me every year you know, ‘do you still want to do it next year?’ He’s always hoping I won’t say no. But you know, so I’ve just continued for the last couple of years taking a more active role in the teaching.

Graham also described teaching as an effort that he would need to make happen to improve his chances of pursuing opportunities at other institutions. Graham indicated that he was second on the list for a teaching position at a regional university. Graham explained, “but it didn’t happen, and I think it was the right thing that it didn’t happen because it was mostly teaching.” Graham continued, “so yeah, . . . I still think about doing some teaching because that’s why they didn’t hire me there, because you know, I don’t have a lot of teaching.” Graham indicated that if he wanted to pursue teaching, he has the opportunity to do so: “I mean teaching is easy because everybody needs help. They wouldn’t say no, especially not to me. It’s not me, it’s just that I’m not a student . . .” In an environment where job security is an issue, maintaining marketability can be a motivation for engaging in teaching, which appears to be the case for Graham. Graham provided additional insights during the second interview concerning his career goals related to teaching, “it’s more contingent on finding a position rather than being a goal of mine. I have students. I don’t teach a class mostly because I don’t want to.”

Although Graham wants to be marketable, he does not want to lose the flexibility doing research alone allows. He explained, “I learn to not stretch too much myself, because then I’m gonna have to sacrifice a lot at home and I don’t want to do it.” Graham continued, “If you start teaching, well you can’t because you gotta do you know you’ve got to go wherever you need to go. I mean it’s a little bit more responsibility, which is okay, it’s a trade off.” Sam also made the

decision not to engage in teaching. He indicated that he prefers to do research, where he can be creative.

Eric's salary is covered fifty percent by the department through discretionary funds that are available to the director of the program within which he works. This arrangement gives Eric time to participate in activities besides research, such as teaching. Eric described his teaching responsibilities:

I am the instructor for one undergraduate class, and I have fifteen students in that class. I'm also a mentor for the undergraduate research program, so I have eleven students from that program, and then I'm a sponsor or co-sponsor for high level graduate students, so I have five of those students. I'm also co-sponsoring one student for an honor project and one for a thesis, and we have about fifty volunteer students in the lab. It's a big lab, about one hundred students.

Assistant research scientists are expected to actively contribute to the research mission at MedU. However, there is flexibility that allows assistant research scientists to engage in activities that align with their individual interests and career goals. Research assistant professors also have the opportunity to pursue teaching opportunities or to focus exclusively on their research responsibilities as well, although research assistant professors are expected to contribute to MedU's teaching mission in the context of research. This included activities such as mentoring, leading journal clubs, or teaching a grant-writing course for graduate students

Research assistant professors. For the research assistant professor role, the MedU faculty handbook indicates that research professor track faculty are expected to actively contribute to MedU's research and teaching missions. The research assistant professor's primary activity is research, but this individual also teaches and mentors within the context of research in the medical school. To engage in substantive curricular teaching, a fractional appointment is necessary as adjunct faculty.

Research assistant professors are expected to have a record of publications in peer-reviewed journals in which they are a primary or lead author. Research assistant professors often participate in national and international professional meetings. To be appointed as a research assistant professor, the candidate typically needs to have evidence of extramural funding with a strong potential for NIH R01 type proposals. NIH R01 proposals are proposals to the National Institutes of Health that typically request \$250,000 to \$350,000 in direct costs annually for up to five years. The MedU Faculty Handbook provides further that research assistant professors typically contribute to education and engage in organizational citizenship. Candidates at this rank usually have documented teaching and mentoring experience within the context of one or more research programs with postdoctoral fellows, junior colleagues, and students at any level.

The activities and expectations described by the research assistant professor participants in this study are very much in line with the role expectations described in the MedU faculty handbook. The research assistant professors who participated in this study are actively involved with mentoring and teaching in the context of research, and some of them expressed enjoyment in seeing the impact of their labors on student success. Although the research assistant professors who participated in this study frequently work as leaders in the laboratory as some of the assistant research scientists also do, they identified their contributions to MedU's teaching mission through mentoring and teaching more prevalently than their role of providing leadership in the lab. For this reason, I have covered the mentoring and teaching subtheme before the leading subtheme.

Mentoring and teaching. As their role is described in the MedU Faculty Handbook, research assistant professors regularly engage in mentoring students and others within the context of research. Mentoring others in the lab was reported as a

common activity among all research assistant professors. Informal teaching through journal clubs was also fairly common with three research assistant professors describing being involved with teaching or mentoring in this way.

Research assistant professors make a significant contribution to student learning when it comes to research. Multiple research assistant professors indicated that they are actively involved with training and mentoring students in research, which can be a time consuming role. They play an active role in helping students learn how to do research through mentoring in the lab and through activities such as leading journal clubs and through teaching a grant writing workshop for graduate students.

Marc described his teaching responsibilities as mentoring and helping students to learn how to be scientists, “I don’t have teaching responsibilities . . . toward my salary. I have teaching responsibilities toward what I believe a researcher should be.” Marc elaborated further on his role mentoring two current students in his lab:

I’m playing a role as a PI with them and I’m trying to make sure that they develop the knowledge of what the . . . scientific method is. And that is the only rule that we need to . . . follow very strict because it’s the way that science is built. Try to explain them . . . how important is experimental design, which is the most important thing. My point is that you try to be a scientist also and my goal is right, so I can build a career path for myself but at the same time this is sharing with people that are learning.

Karen is available in the lab as a resource. She mentors others when their experiments don’t go as planned and they become frustrated. She explained, “it’s like I have to be a psychiatrist to a lot of the people, and you know a lot of my time is spent like consulting and like consoling.” Dave, another research assistant professor, described mentoring undergraduate students as a “major task” in the lab. Charles also indicated that he is relied upon in his lab for mentoring activities. When describing his role in the lab and the relationship with his boss, Charles stated:

I've earned a position of trust with him, so you know I play a pretty active role in mentoring other students, in mentoring post docs and so I feel like I have you know I've developed a skill set that you know I . . . probably wouldn't have otherwise in a different lab.

Several research assistant professors also participate in journal clubs to help students.

Dan and Charles run journal clubs for their departments, and Jason also participates in a journal club for students that are part of a training grant. Dan indicated that he had noticed that students were not learning how to rigorously analyze a scientific journal article. To address this shortcoming, he took the initiative to start a journal club where students could learn how to take an article apart and really analyze it.

Dan described the journal club he started in the lab several years ago:

For the last three years . . . I have done a small journal club. It's very informal and meets every other week, but not always, in which there's four or five graduate students. And what we do is take a paper and basically just sort of take it apart. Because one of the things I've noticed and other faculty within the department have noticed is that students are . . . not taught to sort of rigorously analyze stuff.

Research assistant professors are expected to actively contribute to MedU's research and teaching missions, but only in the context of research. Participants described more formal teaching as an optional role that is available for those who wish to participate in this activity. Many research assistant professors engage in teaching activities to provide a service to the department, or to meet an internally motivated sense of responsibility or expectation. Referring to teaching, Dan indicated, "if you're interested, then they are happy to use you for whatever." When Dan's boss told him that the department could use his help, he enthusiastically agreed to do it. Dan works with post docs in a grant-writing course, which aligns with the expectation that research assistant professors contribute to MedU's teaching mission in the context of research.

At least one research assistant professor indicated that he teaches because he believes that, even though the expectation is that he dedicate his time to research, as a faculty member he has a personal expectation that he also engage in teaching.

Jason described teaching as a personal expectation for his position:

So really . . . what I'm expected to do is research. And so . . . that being said, the department understands and [boss] understands that I have to actually kind of expand and have some you know, I can't just lock my door and you know, work on power point slides or models, or whatever, the projects. And I should probably be teaching a little bit, and I should probably be involved in some service, so these things are you know, I can't start making that . . . like 50% of my effort, but there's a lot of flexibility for me to do those things. So I teach a little bit in the fall, and I teach a little bit in the spring.

Jason also believes that teaching and research should happen together. Research provides a broader perspective for his teaching, so this is an additional motivation for teaching.

Karen engaged in teaching as a way to help the department, and to relieve some of the pressure on the lab to cover her salary. A course coordinator recommended Karen as a course leader, and she agreed to take on the responsibility:

She [course coordinator] actually went to the department chair and said 'I think it's time someone else took over the course,' and for some reason she suggested me. And I was willing to, especially if it helps the lab by taking off some of the salary. And so it was something I could do, even though my background is actually in developmental biology. But I think it was good. I can contribute some service to the department.

Charles was also recruited to help the department by engaging in teaching when needed. When an assistant professor in another school was not awarded tenure, Charles's boss recruited Charles to teach the course. Charles explained:

So he was like [Charles], would you like to teach the [school] students? Because he knew I liked to teach, and this was also solving a problem for him. He wouldn't have to go up to one of his tenure faculty members for more teaching. He could just ask me to do it.

Although research assistant professors are not expected to participate in formal teaching activities, they have the opportunity and flexibility to do so if desired. Those who chose to engage in teaching activities did so for different reasons. The desire to be helpful to the lab or to the department was a motivator for two research assistant professors to teach, while another pursued teaching opportunities to aspire to what he believes a faculty member should be.

In addition to mentoring and teaching activities, research assistant professors also often provide leadership in the lab as part of their usual responsibilities.

Leading. Several research assistant professors who participated in this study spoke about leading others in the lab, such as students, technicians, and postdocs. These research assistant professors play an important role in the lab supervising and training others, as well as being an available resource. Contributing in the lab as leaders and mentors provides support to the principal investigator in the lab, who is often an instructional-track faculty member.

Brad supervises all of the students in the lab as well as a couple of post docs. Dan also participates in training and directs students in certain areas of research in the lab. Jason described himself as his boss's "right hand man" in the lab. He is helping to bring in funds, and he is also working on projects for the whole lab. Karen indicated that her boss prefers that she focus on being in the lab as a resource at the bench, where people can ask questions. She also described her role in the lab as broad, "I know I end up taking care of more things than just my own experiments." Charles also stated that he does very little bench work himself, but he directs others in the lab, such as undergraduate students, technicians, graduate students, and post docs.

Summary, theme 1: role. Both assistant research scientists and research assistant professors consistently meet the expectations laid out for their respective faculty group in the

MedU faculty handbook. However, both groups also frequently go above and beyond the minimum expectations. Assistant research scientists usually serve in a leadership role in the lab, where they also mentor students, while research assistant professors work with students more prevalently through mentoring and teaching, such as by running journal clubs or by taking on teaching responsibilities to help the department.

Theme 2: The Work Itself. Both assistant research scientists and research assistant professors indicated that they enjoy doing research or science. Assistant research scientists were more likely than research assistant professors to mention helping others as a satisfying activity, while research assistant professors were more likely to mention deriving satisfaction from working with students. Overall both groups expressed satisfaction with the work itself, and they also valued the opportunity to be self-directive in their work.

Assistant research scientists. All six assistant research scientists who participated in this study indicated that they find the work of science or doing research itself satisfying. A majority of the assistant research scientists also enjoy helping others. The subthemes I have included for assistant research scientists include: the love of research; helping; and autonomy.

The love of research. Being able to do research was so satisfying and rewarding for some assistant research scientists that they were willing to accept lower compensation than they could make elsewhere to have the opportunity to continue doing the work. The excitement that research brings and the potential to have a positive impact on human health were also reasons that assistant research scientists chose to do research as a career.

When asked about the ideal work environment, Graham acknowledged that he could look for other positions that could possibly provide a higher salary if he has a grant funded, but he

could also just continue as an assistant research scientist. Graham explained, “I could keep going like this for ten years. The research projects, I mean they are exciting.” Graham continued,

But if you get funding then you’re marketable somewhere else, and so you might get a better salary somewhere else. So maybe try to have a play with that and make it also a path that is recognized but also it’s not bad if you’re in this position for six, twelve, whatever, twenty-four, eighteen, whatever, twenty years. It’s okay to be in that position. Your salary might be a little lower, your responsibilities might be a little lower, but it’s okay. Ultimately it’s about, at least for me, science.

Graham indicated further this it is more difficult to focus on the research when you have a lot of responsibilities. He explained how he enjoys doing the work, “I know many PIs that they say things about something, something unique, some tools, methodology but they don’t really know how to do it.” Graham continued, “It doesn’t matter, that’s not their job. They can find somebody who can do it and they’re happy with that. So I’m not happy with that. I really like to do it. And that’s why this is good.” Graham continued, “I think it’s a great life, in my opinion, if you like to do science and research.”

Even though the pay is lower than industry standards, Jay decided that working in biomedical research would “have a more satisfying impact” than working for a private company, so he chose to pursue a career in academia. Jay also indicated that he enjoys doing research. When asked what made a staff scientist position appealing, he responded, “It’s an opportunity to do research, which is what I love to do.”

When Trace discussed what he finds satisfying about his position, he mentioned aspects of science itself, “[y]ou know again, regardless of this position, any time you do an experiment that gives you a really great result either that you were hoping for or that you weren’t expecting, you know those are always you know, great moments.”

Sam also enjoys the work involved with science. He described his work:

. . . to be able to plan an experiment and the outcome is very good. That is exciting. So if we don't get that one we admittedly don't like what happened, we need to solve the problem. So . . . I like that research.

Eric indicated that he really enjoys doing his work, but he related this enjoyment to the clinical aspects of his research. He described his research as “a link between what you can do in the future in the clinical side in experimental models.” Eric continued, “So that's what really caught my attention. I really enjoy doing it. A lot of the things we do here can be applied tomorrow in the hospital.” To Lisa, science is interesting. Lisa also indicated that science has the potential to lead to new treatments for patients.

Whether the research is exciting, interesting, or is making a positive contribution to human health, there is a general consensus that assistant research scientists really enjoy the work they do. Along with enjoying doing the research itself, assistant research scientists also value the opportunity to help others, the subtheme I cover next.

Helping. Being helpful also emerged as a satisfying aspect of work for assistant research scientists. Two research assistant scientists described the potential to help patients as a satisfying aspect of their work. Two other research assistant scientists discussed helping others meet their needs, whether by providing a service, or by providing support to others by interviewing candidates or sharing an unfunded grant proposal.

Eric's interest in his work is tied to helping others. Eric is involved with developing new applications and new technology that are used in the hospital. He explained that he would not change anything that he does, as his group is “looking to support those patients that don't have any other option.” Eric identified helping patients and working to change current outcomes of illness as positive aspects of his work.

Jay also expressed being helpful as a real motivator in his position:

So there's two things that really motivate me in this work. And they're intertwined. So one is getting the work done. We do work that our customers really need. They really need us to do what we do, and we do it. Our goal is to make sure that the customer gets what they need, and since we're at an academic institution and because we have some funding from the institution it gives us a lot of flexibility to educate our customers, do whatever work they need us to do, and kind of go above and beyond more than necessarily what a strictly commercial vendor would do. So I feel really good that we do work that's really important to the research community. The other thing is I feel really good about . . . doing the stuff that has to be done so that the scientists in our group can do their work, so that they can do the science.

Jay also talked about providing services to another institution to review their facilities. He said that he was able to "make a positive contribution," and do something that is "useful." Similarly, Lisa indicated that a positive aspect of her position is the potential to help a patient with the development of a new treatment. Graham also discussed being helpful by interviewing postdoctoral candidates at a department chair's request. Graham explained, "so for example, when she wants to hire people she wants me to interview them. So . . . I know why. I know what she's looking for, and so it feels good, and I can contribute." Graham also provided his unfunded grant proposal to a postdoctoral researcher and told her to see what she could do with it. Graham saw himself in the postdoctoral researcher, and he wanted her to be successful in getting a grant.

Four of six assistant research scientists indicated that they valued helping others in their work. These assistant research scientists were able to provide help by working to develop treatments for patients, by providing research core services to both internal and external clients, and lastly, by helping others in the department. Helping in the department was demonstrated through committing time to help the department chair interview prospective postdocs, and by sharing an unfunded grant application with a postdoc as a learning tool.

In addition to helping others, assistant research scientists also identified autonomy as an aspect of their work that they valued.

Autonomy. Several assistant research scientists recognized flexibility to direct their work as a positive aspect of their jobs. Having flexibility was reported to enhance productivity and to contribute to achieving a positive work-life balance. Autonomy also includes the ability to choose what kinds of work to pursue. Although assistant research scientists do not have an institutional expectation to engage in teaching activities, this group has the flexibility to pursue teaching if they wish to do so.

Graham indicated that his position gives him a lot of freedom with time. He explained, “Nobody is really checking on me. I have to do stuff and I get it done. But I don’t have to be here at nine and leave at five. Nobody is going to check on me. Nobody cares if I’m here you know, and that’s great.” Graham also indicated that he is more productive when he has such flexibility with his time.

Jay and Trace also indicated that flexibility is a positive aspect of their positions. Jay enjoys the flexibility his position provides to do research and to teach, and he acknowledged that his position gives him a work-life balance that is appropriate for him as a second career. Trace indicated that as long as the work is getting done, he has the flexibility to do what he needs to do to complete his work. Like Graham, he also feels that this flexibility allows him to be more productive. Lisa also acknowledged autonomy in her position by stating that research allows “you to be your own boss.”

Overall, assistant research scientists value autonomy and being self-directive in their work, both in terms of schedule and task completion. Research assistant professors also value doing research and having autonomy. However, research assistant professors expressed a higher level of satisfaction from interacting with students than was the case for assistant research scientists.

Research assistant professors. Research assistant professors consistently enjoy doing research whether they are using their hands or expressing their creativity in their work. They also derive great satisfaction from seeing their impact on students. Further, research assistant professors value leading their own work. The subthemes I have included for research assistant professors include: the love of research, working with students, and autonomy.

The love of research. Some research assistant professors enjoy using their hands and doing experiments themselves, and they also value the ability to be creative in their work. For example, Dan really enjoys working in the lab. When describing his ideal work environment, Dan stated, “I like working in the lab. I like doing the actual experiments. I like working with people on designing and analyzing and understanding their data.” Dan continued:

if I had my perfect job it would be very much like what I do now with my own lab work to do, and with my own science to do, but also having two or three other people who would work on similar kinds of things

Dan described further, “yeah, I like what I do. I like the people I work with. I like the job that I do. You know, I come in and do the kind of stuff that I enjoy every day rather than the kind of stuff that I don’t enjoy.”

Karen enjoys working in a hands-on position. “I want to stay doing research, mentoring people in the lab, you know, being like a hands-on person.” She also enjoys the ability to be creative. Karen described her job as pretty ideal for her, except she indicated that the pay in academia is not as good as in industry or government. However, she described her salary as adequate to meet her needs.

Dave enjoys being able to express his creativity through his work. Dave spoke about training as a physician, and he reflected on what his career would be like if he had not transitioned to working in research. He described practicing medicine as following protocols and

observing rules. Dave explained, “[t]hat’s the main reason I think why I did not want to switch back. And every once in a while you will be able to do one or two experiments that’s really exhilarating and one of a kind. I think that’s very rewarding, for sure.” Dave also mentioned that a positive aspect of his position is that he has a lower burden of responsibilities than a tenure-track faculty member. Dave prefers not to teach, and he does not care for traveling or going out to dinner with people he does not know. Dave is committed to his work to seek the scientific truth.

Research assistant professors described valuing doing research, which allowed them to use their hands and to express their creativity through their work. Research assistant professors also described working with students as a rewarding aspect of their work.

Working with students. Working with students has a more prominent role in the work of research assistant professors than in the work of assistant research scientists. Unlike assistant research scientists, research assistant professors have an institutional expectation to teach and mentor in the context of research. Research assistant professors identified working with students as an enjoyable aspect of their work. It is satisfying to research assistant professors when they see students succeed due to their efforts, such as passing preliminary exams, getting into medical school, or reaching a goal.

Dan enjoys working with graduate students. When asked about a time that he derived great satisfaction from his job, Dan described when a graduate student passed her preliminary exams:

I had worked together with her basically from the very beginning when she got in the lab and basically taught her all the stuff that she knew, was a significant part of helping her design her own research proposal, and that work that she was going to work on, and also helped her in the writing of her proposal for her preliminaries.

Dan elaborated about what was satisfying about his student’s success:

I think being able to watch her having gone from a new student who . . . had some research experience, but it was very different than the research experience we do now, and learn how to pull out the literature that she needed to . . . analyze it, formulate experiments, and things like that.

Brad also described student success as satisfying:

For me, when my students do really well it's very satisfying for me. I think I'm . . . happier for my undergrads when they get into med school than . . . they are because I'm like, 'oh yeah, I . . . helped that person get in . . . so that's a pretty satisfying part of the job.

When asked to tell about a time when Marc derived great satisfaction from his job, he indicated that he derives great satisfaction when he sees "his kids" succeed. Marc continued,

[t]his man, he just got into a residency program in the United States, which is what he wanted, and it's very difficult coming from another MD school in another country, compete with MDs from here. So and in that situation now having a position as a resident make [him] equal to the rest of the people. When he told me, I cried.

Marc described education as not being a part of his salary, but he takes the education of students very seriously, and he enjoys seeing the progression of students' work.

Some research assistant professors described deriving satisfaction from seeing students learn and from seeing and fostering talents in students. Charles identified mentoring students as a satisfying aspect of his position, particularly when he is able to identify when a student has learned something new:

I really enjoy working with the undergraduates. And so they're easiest to read, so I think when they're actually learning stuff you can see it. You can really see it. And I find that to be very rewarding, like when their little lightbulbs go off. I get satisfaction from that . . .

Dave described working with undergraduates as one of the biggest rewards of his work. He sees a lot of talents in students. Dave explained:

you know, coming here, I can bring out the best of them. I can see my impact, you know in those kids. I can show the excitement in doing science and benchwork, and also cultivate all kinds of good qualities in doing science, which can be transferable to any

other careers they want to pursue.

In addition to the love of research and working with students, several research assistant professors described autonomy, or the lack of it, as a positive or negative factor in their work.

Autonomy. The ability to make decisions or to be self-directing in their work impacts how research assistant professors perceive their work. Dan acknowledged a lack of autonomy in some aspects of his work. Because Dan is paid from grants, he must do the work required by the grant. Although Dan's boss listens to what he has to say, ultimately it is his boss who makes the decisions, which can be frustrating to Dan as he explained:

. . . since I'm not the boss, sometimes the decisions that I would make and the decisions that the boss would make are different. And that's based on my experience and what I've seen, and things that I've seen work, and things I've seen that haven't worked. So it's a little frustrating to be in a position of not being able to say 'no, this is the way we're going to do it,' . . . but the plus side is that I'm listened to right, so when I say, 'you know, I don't think that's the way to do it,' I'm listened to, it's considered, but then the decision is made by somebody else.

Dan also acknowledged that he can have more autonomy in his own research, and that his boss is supportive, "I actually like what I do. I would like to have a little more control over what I do, but given the way things are set up right now, I don't have that. If I had my own funding . . . my boss would be perfectly happy to let me do that." Dan has the opportunity to pursue independent funding, which would give him more control over scientific decision-making.

Jason described his position as being pretty close to his ideal working environment. The positive aspects he highlighted included the freedom to think about things and to work on different projects. Both Karen and Charles also enjoy the freedom to direct their own work. Karen plans experiments and trouble shoots. However, she balances the need to consult with her boss if there is an added expense that would be required by the direction she would like to take. Overall she appreciates the opportunity to direct the day-to-day activities in the lab. Similarly,

Charles described himself as the creative force behind some of the work he is doing. Charles also directs others in the lab. Charles explained, “I think being able to direct my research, whether I’m doing it personally, or other people are doing it, is equally satisfying to me.”

Summary, theme 2: the work itself. Both groups of research-track faculty enjoyed doing research, and they also valued having autonomy to direct their own work having the flexibility to direct and complete research using their own skills and creativity. Assistant research scientists indicated that they really enjoy the opportunity to help others while research assistant professors identified working with students more prevalently as a satisfying activity. Research assistant professors were expected to engage in teaching activities in support of the research mission at MedU. This faculty group expressed enjoying working with students which allowed them to see their impact on student learning and success.

Theme 3: Resources. Financial aspects of being a research-track faculty member have an important impact on research-track faculty work because resources are needed to not only do the research, but also to support personal salaries, and to position oneself for future career opportunities. There was a general consensus among both faculty groups that acquiring funding is particularly difficult for research-track faculty. Grant reviewers often question a person’s independence in the lab. Research-track faculty also expressed being discouraged given the tight funding climate. If a tenured professor is unable to secure funding, they wondered, then how they could they possibly be competitive themselves?

With the exception of compensation, which assistant research scientists discussed more prevalently, I identified the same subthemes for both assistant research scientists and research assistant professors, including job security, access to resources, and seeking funding and competition.

Assistant research scientists. The assistant research scientists who participated in this study consistently described job security as a concern in their position. Although this group indicated that they are able to access any resources they need at MedU to do their work, they described working to obtain and maintain funding as an on-going struggle.

Job security. A lack of job security is a negative aspect of the work for assistant research scientists. Five of the six assistant research scientists described job security as a concern in their work. As a matter of practice, MedU does not typically commit ongoing funds for research-track faculty salaries, though there are limited exceptions. Assistant research scientists are primarily paid by collaborating on the funded grants of others, or less frequently, by obtaining independent funding themselves. The assistant research scientists described their role being so tied to grant funding, that if the grant funding were to disappear, then they would no longer have a job. Working with a highly-funded established principal investigator in the lab alleviated some of the feelings of insecurity, but nevertheless, this aspect of the job still detracted from the overall job satisfaction of this group.

Graham's description of his perceptions of his office space reflects the insecurity often felt as an assistant research scientist. Graham explained how he felt about his new office space when he accepted a partial appointment in another school at MedU:

I didn't know how long this was gonna last. I mean these offices are great. At the beginning for the first two to three months I was three doors that way, then they moved me here. So I didn't know what was going to happen. Then after a year . . . my wife said, 'why don't you put something in the office?' And so I put some frames and stuff. So I still feel like I might be gone, you know what I'm saying?

Trace contrasted the department's commitment to research-track faculty with instructional-track faculty:

So again . . . with research faculty, the department does not have any kind of commitment to you, for space, for salary, for anything. So for example, if I as research faculty if I was

working in this lab, if I didn't get my own grant, and if the lab ran out of funding, you know, the PI of the lab who is tenured, he can be supported by the department. The department has a commitment to . . . support them that does not extend to the research faculty. So in that kind of situation, if the money just completely ran dry, you know, I'd just be . . . out, along with everyone else in the lab.

Trace's statement indicates that research-track faculty would be out "along with everyone else in the lab." Despite their active role in leading and mentoring others in the lab, research-track faculty do not enjoy any more commitment or security from the department than others in the lab, including students, postdocs, and technicians.

When asked to describe the ideal working environment, Eric indicated that the concern about funding takes away from the ideal working environment. Eric explained:

I think it would be a place where you don't need to worry about the funding. You have a place that if you are committed to do something, then the funding should be part of it, and not all of it. And your future should not depend on that.

Eric's statement reflects the lack of a reciprocal commitment. Even though research-track faculty members have expressed being committed to their work, they do not enjoy a commitment from the department in return. In an insecure environment, to increase his value and relevance, Eric indicated that he is trying to find ways to make himself unique so he can continue doing what he is doing. His department chair nominated him to participate in a professional development academy where he can build on his existing skills. Eric plans to pursue this opportunity if accepted into the program.

Sam also described his job as being dependent on grant money. He explained if there is no grant money, then he would not have a job tomorrow. Sam continued to explain that he could go ask others that have funded labs if he could do work for them, and he could then potentially transfer his position to another lab if necessary.

Insecurity is an important factor in Lisa's job as well. She indicated that the lack of job security takes away from enjoying the job. As she is getting older, she becomes more worried about not having a lab and a permanent position.

Although assistant research scientists often experience insecurity in their positions, they typically have the same access to resources that any other faculty member has, regardless of appointment type.

Access to resources. Overall, assistant research scientists expressed that they have access to the resources they need to do their jobs. Graham explained that he has all the tools he needs, and a subscription to any paper or journal he could think of. He also indicated that he has never been denied anything. It has also been Jay's experience that he has been able to access any resources needed. Given that Jay works in a core facility, often the resources available are shared among investigators at MedU. Trace indicated that his access to resources has not changed from being a post doc, or even a student, to being research faculty. The resources needed to do research are available. People in the lab share equipment with each other, which has not been an issue.

Eric indicated that the department has funds available for equipment. However, these funds are primarily for equipment that will benefit multiple people. When a specific piece of equipment broke, it took two years to replace it. Eric explained that when the equipment was broken,

. . . it took a lot of time and effort to try and get one [broken part]. And you know in order for me to get the department to sponsor us, I had . . . not only to get letters from different people, but it was a political kind of challenge. It got sponsored, but we were able to find a used unit from the hospital, so the cost was very minimal, but it did require a lot of effort and time trying to get things approved and people to understand that it was a need not for me as for the institution.

Eric elaborated about the distribution of resources during the second interview and stated, “I think it just depends on the goals of the department or the section head of that department. So if your request fits his needs or his plans, then that money will be assigned easily to you.” Eric provided further that relationships also impact the distribution of resources. However, he did not indicate that a faculty member’s appointment type influences the distribution of resources.

Seeking funding and competition. Seeking funding is a critical aspect of research faculty work. Assistant research scientists are not required to have independent funding, but they have the opportunity to compete for funding if they wish to be an independent scientist. If an assistant research scientist does not have independent funding, they must cover their salary by working as a co-investigator on other people’s grants. Four assistant research scientists expressed challenges to seeking grant funding including competing with tenured faculty who are also struggling to get funding themselves, and being scrutinized by grant reviewers due to their job title. A job title, other than a traditional tenure-track position title, brings questions and doubts about research-track faculty independence and qualifications.

Graham described the importance of funding at MedU, “Here, what dominates is the funding. It’s not just here, everywhere. If you have grants, if you have somebody that guarantees for you, you can be anything here.” He also described the process of pursuing funding as a lottery, “I’ve seen things that were ridiculous, like something was funded, something wasn’t funded, something was much worse and it was funded. So you know, I know it’s a lottery, especially when the pie is smaller and there’s a lot more people.” Graham stated further, “I’ve been in grants with more than one PI super expert in the topic and didn’t get funded. So if they don’t get funded, how can I be funded on that?” Graham described tying funding to his self-

worth, “So if you don’t get funding, you’re not worth it, basically, that’s the message. You have to . . . associate with somebody else and do some other people’s research.”

Trace described applying for grants from a disadvantaged position, “this is research track, which means we’re eligible for pretty much any grant that you would want to write, but that doesn’t mean you’re necessarily likely to get any of those grants . . . you know I don’t have my own lab, I don’t have my own staff.” Trace continued and described grant reviewer comments concerning his status:

the comments were always very positive, the scores were always pretty mediocre, and I think that was partly, and . . . I’ve been told this by people who sat in on study sections as well, that you know, they see this position as kind of problematic . . . for giving those kind [NIH] of grants out, especially when established, you know, tenure track faculty aren’t getting grants. It’s kind of difficult to justify writing the check for someone who is essentially in their mind, we like to jokingly call ourselves ‘baby faculty.’ We’re faculty, but you know we’re not really, we don’t do all the things the faculty do.

Trace expressed concern about competing with tenure-track faculty, “I’m like never gonna get an R01 in this position when I’m going up against someone who’s had a lab for thirty years, and you know, they’re having trouble getting funding. Why would the NIH give me the money?”

Eric has also experienced difficulty when applying for funding from the NIH. When describing how the NIH reviewers react to his role, Eric stated:

I have the support, and I tried to be a PI, but from the NIH it’s always . . . he lacks experiences, he lacks the skills. From the DOD [Department of Defense] it was different because they acknowledged the skills, experience, and they also acknowledged that there was infrastructure behind me, and I was not alone, yet . . .

Eric stated further, “they always . . . have to comment about my position and my role and my credentials. In all the grants there is always a comment.” However, Eric feels supported in his pursuit to obtain funding. Eric stated, “I’m lucky enough to have great mentors, and they would say, ‘you know, don’t worry about it, they don’t understand. . . we’ll just change things around

next time,' right, and that's what we do." Even though Eric's proposal to the DOD was not funded, he did receive a favorable score, and he was encouraged to re-submit his proposal.

Lisa also expressed frustration about competing for funding with tenure-track faculty. She indicated that putting in the effort to apply for funding is "probably useless." Lisa feels that if research faculty members are competing with tenure-track faculty, "they don't have a chance."

There is a general consensus among assistant research scientists that they do not compete with instructional-track faculty from a level playing field. As research-track faculty, they do not have the track record or the resources that an instructional-track faculty member would have. Further, a job title that is not familiar to grant reviewers can call into question a person's qualifications and experience.

Along with identifying the difficulty of obtaining independent research funding as an issue, assistant research scientists also described compensation as low.

Compensation. Assistant research scientists who participated in this study often mentioned compensation as a negative aspect of the position. Jay indicated that compensation is lower than industry standards. However, as mentioned previously, because Jay believes that working in biomedical research would be more satisfying and impactful for him, he chooses to work in academia. Within academia, Jay also believes that research faculty members receive lower compensation than they should compared to staff scientists.

When asked about the ideal work environment, the first thing Graham mentioned was that he was going to eliminate salary issues. He continued, "sometimes you can make yourself like everything to raise your salary, for a little bit though. Then your life is not going to be great." For Graham, having a lower salary is a trade off with some of the positive aspects he has described about his position, such as having flexibility and less responsibility.

Not all research-track faculty members feel that they are doing less than an instructional-track faculty member. Trace explained that even though he is doing much of the same work that an instructional-track faculty member would be doing, he does not receive the same compensation. “But if I’m doing all this stuff, I may as well be in a position where I will be, you know, kind of acknowledged. You know . . . you don’t get paid anywhere near [as much] as research faculty as you would as tenure-track faculty.” Trace elaborated during the second interview, “In many ways you take on much of the [same] responsibility of an assistant professor, but with less security and pay. You spend considerable time developing your research, but if you don’t get your own lab out of it, it’s a lot of effort without reward.”

Lisa also indicated that as a research faculty member, that pay is not good. Likewise, Karen believes that salary is low, but she described this more broadly to include all academic careers compared to careers in industry and government.

Although assistant research scientists described having access to all the resources they need to do their work at MedU, a lack of commitment from MedU resulting in reduced job security as well as the continuing struggle to fund their salaries detracted from their overall job satisfaction. While compensation was mentioned by assistant research scientists as a negative factor in their jobs, some assistant research scientists attributed lower compensation to working in academia rather than to their position as a research-track faculty. However, two assistant research scientists described compensation as low in general, while another felt underpaid compared to his instructional-track colleagues.

Research assistant professors. Financial aspects of the work also influence how research assistant professors experience their work. Job security, access to resources, and seeking funding/competition were all subthemes that emerged in the resources theme. Unlike for

assistant research scientists, compensation issues did not emerge as a subtheme for research assistant professors.

Job security. Several research assistant professors who work in well-funded labs did not express concern about job security concerning their own position currently, but they acknowledged that job security can be an issue in the future. The PI for whom Dan works is very good at getting funding. As long as she continues to be successful in this regard, Dan feels that his position is secure. Dan described his career stage as being a factor in how he perceives his job security, “[i]t’s also the case that I’m not at the beginning of my career. So worrying about whether I have a job in twenty years’ time as a research-faculty member is not really an issue for me. Worrying about having a job in five or ten years’ time, yes, but not twenty years’ time.”

Karen also feels that funding is good in the lab where she works, so she is not concerned about job security at this time. She explained:

. . .ten percent of my salary is from the department because of [teaching], but still, ninety percent is off soft money, which is always an issue when you’re non-tenure. I mean it’s always dependent on grants, and that’s why it’s not quite as stable, but we’ve been pretty good with funding, so we should be okay.

Karen has worked with the PI of her lab for a number of years, and they have a good working relationship. Jason also has a good working relationship with the PI in his lab. When asked why he would be interested in pursuing a tenure-track position elsewhere, Jason responded:

it would just be a supported position, where then I could actually reach, you know, get tenure . . . so this position could end any time, right, and so I still have . . . a pretty good commitment from [PI], but you know, when there’s no money, there’s no money.

Brad noted that there have been some very successful research professors at MedU. He doesn’t consider security to be a big issue for his position currently, but he acknowledged that it could be an issue in the future:

like just say [PI] leaves next year or something. I don't think he will, knock on wood. But you know, just say he does. Then is the new guy coming in going to be as supportive, or new woman coming in be as supportive of me? I don't know. And then I could be screwed potentially. I don't think so as long as you have grants, but you know there's one thing, getting grants and there's another thing having the heads of the department fully supporting you and being behind your back. I have some friends who have grants who don't get along with their department chairs and life is sort of miserable for them.

Even though Dave enjoys doing research, the insecurity of the job can take away from the job. Dave explained, "You do have personal freedom in doing research, but the down side is the uncertain funding situation because your salary is one hundred percent coming from available extramural funds. [MedU] does not provide a penny." Dave looks back at all of the education and training he has completed including an MD, PhD, and a post doc and recognizes the uncertainty of his position, "in looking back at all your education . . . and I am still facing this kind of precarious situation, right. If funding runs out, what would you do, flipping burgers?" Dave describes doing science as a "big commitment and sacrifice." Dave continued, "[i]t's non-stop. Your PhD, your post doc, your assistant professor, associate professor, until even after becoming full professor you still have to apply for grants. It's a situation to struggle with for your whole career."

Job security has taken on new significance for Charles. The lab is currently well-funded, but Charles anticipates that his boss will retire before he does. There is uncertainty around what will happen once Charles's boss decides to retire. Charles has a family, so he considers his job security to not be an ideal situation long-term.

Although job security was described as a negative factor for many research assistant professors, it is more of an elevated issue for research assistant professors who are earlier in their careers, and particularly for those who work in labs where the principal investigator of the lab could retire prior to the end of the research assistant professor's career. There is uncertainty

around what would happen to a research assistant professor's position if a principal investigator in a lab were to leave. Research assistant professors who were working in the most highly-funded labs also experienced less anxiety around job security due to the presence and strength of on-going funding.

Research assistant professors also need to be able to access resources to complete their research. Even though research assistant professors described compensation and job security as low, access to resources was a more positive aspect of their work.

Access to resources. No research assistant professors indicated that they do not have access to resources to do their work. MedU is a well-resourced institution that provides access to resources to all faculty members, regardless of track. Dan indicated that the medical school “has done a very good job of providing the resources through various centers and cores to be able to do almost anything.” A number of centers and core facilities are available at MedU for biomedical research, covering such areas as bioinformatics, DNA sequencing, flow cytometry, metabolomics, microscopy, and spectrometry among others.

Dan described the facilities, “there’s not a facility here that I know of that is not very well run. Some of them are not only well run but state-of-the art.” Dan also has access to department resources, including three confocal microscopes, one of which Dan described as “another state-of-the art top-ranked high quality machine.” Dan indicated that access to resources is first come first serve. When describing access to using resources, Dan stated:

So if there was a faculty member, a full professor . . . with a large lab, fully funded, he’s got the same chance of doing it that I do, which is great. Because that means that I don’t have to worry about getting access to the equipment and services, and have to fight people to get there. You have to fight people only in terms of having to convince people that your stuff might be higher priority, but usually that’s not an issue, and usually it’s with the people who are actually doing the stuff anyway.

Similarly, Karen is able to access any resources she needs to do her work. Larger items need to be written into a grant, but smaller items that are less than \$10,000 can often be purchased if needed.

Resources may also include discretionary funding from the department or from the principal investigator of the lab to cover salary so that research assistant professors can engage in activities that are not funded by grants, or for additional needs, such as memberships to societies or other discretionary funds for conference travel or the purchase of books. Departments typically do not provide such resources to research-track faculty, although some research assistant professors have been able to negotiate some support from the department, either directly with the department chair, or through the principal investigator in the lab where they work.

Jason explained how his boss has lobbied for him. As part of his position, Jason is expected to join professional societies. However, Jason did not have the funds to cover this cost. Because this cost was not an allowable expense on a grant, Jason did not have a way to cover this cost except with personal funds. However, his boss and the department agreed to split the cost.

Jason has been provided with resources from his boss's discretionary funds to cover five percent of his time for grant writing and to attend professional development activities. Given the demands of his position, Jason believes that five percent of his time for grant writing and professional development opportunities is unrealistic. Research Assistant Professors are expected to obtain independent research funding. To be successful at acquiring funding, significant time must be spent writing, submitting, and re-submitting grant applications. Federal rules pertaining to research grants do not allow time spent on grant writing activities to be charged to federal grants. If a research assistant professor is unable to charge time to a grant to cover salary, salary for that time spent must be covered by another source.

Jason also described not having much time available to attend professional development opportunities. When salary is covered by grants, this time cannot be used for professional development activities but must be dedicated to working on the grant projects. Jason noted, “. . . the department, they’re getting a lot from me, but they’re not . . . giving that much to me, right, besides support and things like that, but I mean money wise and time wise.”

Brad’s situation is also a little unusual in that he was provided with start-up funds when he was recruited to MedU. The principal investigator, a division chief, has discretionary funds, and he has been generous with paying for student conference travel or for other things that Brad has requested. Brad also indicated that he has access to core facilities and other resources needed to do his work.

Dave described having community resources available that everyone can access to do their research. He also stated that the department has “a lot of resources that can help with . . . grant applications as well as publications.” However, it is Dave’s understanding that MedU does not allocate resources specifically for non-tenure-track faculty, such as start-up packages and signing bonuses, that he believes are provided to tenure-track faculty only. Dave’s experience is unique because his spouse received such resources as a tenure-track faculty member, but Dave as a research-track faculty member did not receive the same resources. Given that Dave has a spouse who was hired on the tenure-track, the contrast between the access to resources for research-track faculty and instructional-track faculty may be amplified in his situation.

Marc described the resources available from MedU as “great.” He also described himself as a “poor guy” who is “growing in his career.” He uses collaboration a lot to access resources by collaborating on grants. Charles on the other hand works for a highly-funded department chair with access to discretionary funds. Charles has the opportunity to work on his own research

in the lab, which is partially funded by grant funds and partially funded by the PI's discretionary funds. Charles described the lab where he works as well-resourced. Common equipment is shared on a first come first serve basis, but much of this equipment is also available in the lab.

Based on the interview results from research assistant professors, it appears that everyone has equal access to the plentiful resources at MedU to do their research. However, there is some inconsistency with support that individuals receive outside of grant-related salary recovery. Whether a research assistant professor receives support beyond salary covered by working on grants depends largely on the principal investigator in the lab. If the principal investigator is a division chief or department chair, they appear to have more extensive discretionary funds available and are more likely to share these funds with research-track faculty. However, unfortunately, access to resources while often perceived as a strength in a grant application, does not eliminate difficulties that arise for research assistant professors when competing for external research funding.

Seeking funding and competition. Obtaining grant funding is difficult for all faculty, and has particular challenges for research assistant professors. Research assistant professors often feel discouraged by the prospect of competing for limited funding with instructional-track faculty, the faculty group that is eligible for tenure at MedU. Instructional-track faculty members receive more resources and technical support from MedU in the form of start-up packages and space than is the case for research-track faculty. Instructional-track faculty members are also eligible to apply for more external funding opportunities, which often require tenure-track status to be eligible to apply. In light of these constraints, some research assistant professors have decided to submit grant proposals with another person as the PI to increase their chances for funding. Obtaining funding of some sort to cover salary sometimes becomes a top priority, even

when such funding will not count as independent funding toward meeting promotion expectations.

Dan noted, “grant funding is so tight right now, and it’s so difficult to get funded, and so few grants get funded.” This takes away from Dan’s ideal working environment. Dan also described the difficulty of competing with instructional-track faculty for internal seed funding at MedU:

And often times it’s difficult to get access to that seed funding because the proposals that you’re putting together are not as fleshed out as some of the proposals of someone that already has an R01 and has been able to devote . . . a significant amount of time in developing the preliminary data that you need, and then so you are competing with that. That makes things a little difficult.

Marc described submitting a grant proposal to the NIH two or three different times without success. After changing the PI name to another person, the grant was funded. Marc feels that it is necessary at times to provide ideas to a person who is better positioned than him to bring in grant money to secure his salary. As a result, Marc will not get credit for the grant, but he will be able to cover part of his salary. Marc also elaborated on how difficult it is to obtain funding, “I’m spending at this point probably seventy percent of my time in writing grants. Ten years ago you need[sic] to submit three applications in order to get one. Today, you need to submit ten applications to get one. That is how hard it is today.” Marc indicated that all of the time that is being spent writing grant applications is time taken away from doing the research. If salary is in fact being charged to research grants while time is being spent writing grant applications, this does indeed not only thwart research productivity, but it also diminishes the potential impact of federal research dollars.

Another difficulty Marc explained is that sponsor requirements for many foundations and outside industry require that applications be submitted by tenure-track faculty. Marc described

how this puts research faculty at a disadvantage when pursuing grant funding. Funding from foundations and other outside sources is often needed to generate preliminary data that can be used for large grant applications to the NIH. Tenure-track faculty members often have funding already, and they are further advantaged over research faculty because they are eligible to apply for funding from many more sources.

Marc described the severity of the shortage of funding:

I'm seeing people closing their labs right now, big people. . . . I'm talking with them, my mentor, they're mentoring me in some way, years of grant funding, and right now they are in crisis, you know, let go people from the lab. Say if you had that situation, what can I expect that I'm in the beginning of this process, you know. And they say, 'well it's tough in this business, you know, there are good times and bad times,' and they talk like a normal thing, but in the last ten years . . . when you are seeing this, where are you going now?

Jason also indicated that sometimes research professors need to include someone else's name on a grant proposal to get funded:

sometimes . . . I would rather have [it] funded than to have . . . my name on it, on the top of it right. So that's maybe a little bit of the role of a research assistant professor, is kind of realizing when that has to be done. And it's not . . . just the way things work. It's the game you play, right.

Charles too described research faculty as being handicapped compared to people on the tenure track:

Independence. . . . I think that's the main thing. Folks who are reviewing grants know what research faculty are, and so you know, we can say I have x space that's my own, and I have x resources available to me, but you know most people reviewing that grant are gonna be like, well he's got some space in [boss's] lab, and these are all [boss's] resources, and it's just, you know how much of this is helping [boss], and how much of this is for this independent guy?

Charles has been spending less time writing his own grants and more time helping others. He explained, "So I actually was writing grants early on of my own, and those didn't get anywhere. And mainly because of the independence question." Instead of continuing to write his own

grants, Charles decided to help his boss whose grants pay his salary. He is working as a co-investigator on other people's grants instead of pursuing his own independent funding. Charles described the conversation he had with another research faculty member, "you know it just doesn't seem plausible that you'll get a grant unless you have your own shop, and if you don't have your own shop, they're not going to give you a grant, and . . . if I do get a grant, what does that do for me here?"

Summary, theme 3: resources. Both groups of research-track faculty indicated that job security is a negative aspect of their jobs. For those who work in labs that currently have strong grant support, job security was less of an immediate concern, but was still an issue long-term. Assistant research scientists also identified compensation as a negative aspect of the job. Both groups described having access to all of the resources needed at MedU to complete their research. However, even though research assistant professors had access to the resources needed to do their work to the same extent as any other faculty members, regardless of track, obtaining independent funding was a persistent challenge. Given that research assistant professors are expected to obtain independent research funding, they expressed losing hope in their ability to be successful in an environment where independence itself is often a prerequisite to acquiring independent funding, and acquiring independent funding is a prerequisite to establishing independence. The inability to secure independent funding contributed to the lack of job security. Establishing independence was not as pressing an issue for assistant research scientists who were not required to obtain independent funding, but obtaining independent funding to achieve promotion was still a usual goal of research assistant professors. Nevertheless, promotion does not itself ensure job security. Research assistant professors must still bring in sufficient extramural funding to cover a significant portion, if not all of their salary.

Theme 4: Career and Promotion. The MedU faculty handbook provides details concerning requirements to achieve promotion for assistant research scientists, and for research assistant professors. Assistant research scientists are not required to achieve research independence, but must demonstrate a growing national or international scholarly reputation, and a substantial record of collaborative funding as a team scientist. Some first-author and/or senior-author publications are also required. To achieve promotion, research assistant professors must have independent research, with clear evidence of obtaining significant independent external funding. Numerous first-author and/or senior-author publications are also required for this group.

MedU's faculty handbook also gives some guidance pertaining to review and promotion. Regular and structured review of a faculty member's accomplishments, future goals, and progress toward promotion are described as an integral part of faculty development. MedU recommends that a department chair or division chief or section head, or their designee, conduct a performance evaluation annually. These recommendations apply to all faculty members, regardless of track.

An additional resource at MedU is a website that provides details about appointments and promotions, as well as mentoring and coaching. Information on the website includes tips for success for each faculty track, including the research track.

Both assistant research scientists and research assistant professors are expected to progress within their career paths at MedU. The promotion process was less clear to assistant research scientists than to research assistant professors, so I included clarity of the promotion process as a subtheme for assistant research scientists but not for research assistant professors. The opportunity for promotion, or constraints to the opportunity to be promoted, were more prevalent among research assistant professors, so I included this as a subtheme for this group.

The remaining subthemes are the same between both groups including job expectations, department/PI support, and striving.

Assistant research scientists. Job expectations are defined by MedU in the faculty handbook and are an important indicator of job responsibilities and future pursuits for research faculty. Although assistant research scientists had an idea about what was expected of them as a research-track faculty member, clarity of the promotion process itself was less clear. An additional career-related aspect of assistant research scientists' work experience that I have discussed under the career and promotion theme includes the support of the principal investigator, department chair, director, or section chief. Assistant research scientists must often rely on their boss for support when it comes to their career. The last subtheme is striving. Research faculty members often strive to meet expectations or to exceed them depending on the nature of their career goals, which provides a benefit to the institution.

Job expectations. MedU has expectations that assistant-level research faculty move through the ranks in their respective track. There is also an effort in the institution to ensure that individual research faculty members are appointed in the track that makes the most sense for their own productivity and career goals.

Trace described the expectations of his position as "pretty straightforward." He indicated, "you know, basically, obviously, you have to do research. The expectation is that you are at least making an effort to acquire outside funding of your own, and honestly, that's kind of it."

Trace elaborated during the second interview:

I mean there was a huge push you know when you take this position, at least this is the way it's always been presented to me in this department. If you take this position you know, you're not just a better paid post doc. You are, you know, you are going to be writing your own grants, you're going to be, you know, doing your own thing and not just being a pair of hands in the lab that you're in.

Sam described the assistant research scientist level as not requiring independent funding. However, Sam also stated, “if you want to go to the next level, you have to have independent funding.” Sam perceived the “next level” as a research assistant professor position, or as an assistant professor on the tenure-track. Sam indicated that publications are very important as a research scientist, as well as presentations at international conferences. Lisa also emphasized publications and international conferences as expectations for the assistant research scientist position. Both Sam and Lisa indicated that they can stay in the assistant research scientist position for six years.

After six years as an assistant research scientist, an individual may be either promoted to an associate research scientist, promoted to a research associate professor if their productivity aligns with the requirements of that role, or switched back to a research investigator role. At the point of the third-year review, research-track faculty members are supposed to have the opportunity to meet with an administrator in the medical school to discuss their career progression and goals, and to assess whether they are on track. At this time, a research-track faculty member may request to change tracks if appropriate.

Even though a research-track faculty member can ask to switch to the instructional-track which has tenure eligibility, such a request is rarely granted. A request to switch would require a commitment by the department and the customary institutional approvals for a tenure-track position including approval by the executive committee, the president, and the Board of Regents. In addition to understanding the expectations of their position, it is also helpful for assistant research scientists to understand the promotion process itself so that they can pursue opportunities for a third-year review that are available to them, and so they can keep promotion materials on track.

Clarity of promotion process. The MedU Faculty Handbook indicates that there is a mandated ascension in rank within six years for both assistant research scientists and for research assistant professors. As mentioned above, there is a third-year review, which is mandatory for assistant research scientists. The third-year review is conducted by an assistant dean in the medical school. The Faculty Handbook suggests that performance evaluations take place annually, and that they be conducted by a department chair or division head.

Several assistant research scientists who participated in this study indicated that the promotion process was not very clear. Graham lost track of promotion guidelines when funding was tight and he was looking for another position. He felt that there was some confusion around the promotion process since he had changed fields and a promotion extension was needed. When he inquired about the possibility of a promotion, he was told that he was too late. Graham indicated that due to his publication record, he was a good case for an extension. The administration at MedU supported the promotion clock extension and ultimately provided administrative support for the completion of Graham's promotion package.

Jay, Trace, and Eric also indicated that promotion guidelines were unclear. Trace described receiving support from administrative staff at MedU and Eric described needing support from colleagues for promotion.

Jay explained that the promotion guidelines were not clear to him:

However, the criteria were not all that clear to me. I think the med school does that on purpose. They need to have some sort of objective measures some time, or you know some sort of criteria that are objective. But they also want to have some subjective options to fit into that. So anyhow, I did meet with my department chair, and I mentioned to him that the criteria didn't seem all that clear. He acknowledged that and said that he had been in discussion with the dean's office, and that they had come up with a document that is more clear. He gave me a copy of the document and it's not any more clear in my opinion. It's really not any more clear than it was.

Trace felt that the promotion process wasn't very streamlined when he went through it.

So it was a lot of interacting with administrative staff in our departmental office, and they'd kind of say to me, oh well, I need your CV. Okay, so I send them the CV, and I thought okay, great, done. And then a week later, oh I need . . . a letter of recommendation from this many people. It kind of leaked out little by little, which is not necessarily how I like to do things.

When speaking about his upcoming promotion process, Eric also expressed that the next steps for promotion were not clear to him either. He also indicated that the process requires having support:

What is gonna be the next steps for my promotion is gonna be the next year. It's gonna be to try and see what is going to be the next step and if I can get a tenured position or not is just a challenge, is not that easy. And it does require at least a couple of people supporting you, backing you up. It's not something that I can do alone.

Graham described the research scientist role as a "stopover" or "layover" position, which he felt could explain why some administrators are not familiar with the promotion guidelines.

Even though Jay and Trace did not feel that the promotion guidelines were clear, they better understood the process that needed to be followed to request promotion. Each described checkpoints and timelines concerning the promotion process. Jay indicated:

There is a system and, you know, timelines and that kind of thing. And then at the appropriate time there's a review. And I went and met with the dean for the medical school and he reviewed my CV, says yup, you're ready. You're ready for a promotion. And then it goes to the department to proceed.

Trace also described his understanding of the process:

You know you have these kind of points, where it's like you know, okay, you're in a specific position, right, you're in this position where you're expected to guide your own research and have your own money to some extent, right. I mean you're not supposed to be completely self-sufficient, but you have to have checkpoints along the way where you say, okay, are you actually doing your own research, are you coming up with your own ideas, are you writing your own grants, and if you are great, you know, let's bump you up to the next, you know whatever the next title is.

Research scientists are expected to have a year three review from the administration in the medical school. However, despite making inquiries to schedule a review meeting, this had not happened yet for Trace.

When Sam was promoted from the research investigator level to the assistant research scientist level, he had publications and he was a co-investigator on a grant which fit the criteria to be promoted. Sam indicated that secretaries informed him about the promotion process, and they coordinated the paperwork for him to process his promotion. Sam described criteria that would be considered for him to obtain a promotion, “Right now if you have an independent, not co-investigator, independent grant then they’ll consider . . . the professor level. I submitted two grants. So, if I get the grant, definitely they have to consider me for a research associate professor level.”

Although assistant research scientists generally understood their job expectations, the actual promotion process itself was less clear. However, support from administrative staff and from an administrator who was responsible for advising research-track faculty about the process was helpful. Assistant research scientists also mentioned appreciating support from a department chair or section chief who advocated for a raise, or who provided career advice and support as described in the next subtheme, department or PI support.

Department or PI support. Although the role of the department or PI played a larger role for research assistant professors, a couple of assistant research scientists also described feeling supported through raises, and mentoring, and by having one-on-one meetings with a department chair.

Eric described how the director of his unit is very supportive, “my director, he is always trying to make things right for me. So for example, it took almost three years to get me a raise, a

decent raise. . . . hopefully the paycheck is gonna be better.” Eric continued that when it comes time to go through the promotion process, he will need at least a couple of people to support him. He doesn’t believe it is a process that he can complete alone.

Trace also described his relationship with a department chair as very supportive. Trace described his annual review with the department chair, “so when I met with her it was always really productive. She always spent a lot of time talking about like, alright, what do you want to do, what do you need to do to get there.” There is currently an interim chair in the department that Trace also described as supportive, “it’s always much more been about like how’s it going, what do you need, what can the department do to help you achieve that need.” Trace indicated that it is particularly meaningful to receive support from the department chair when things often do not go as planned, such as failed experiments and unfunded grant applications. Trace explained, “so having that kind of reinforcement from someone whose job is not really to make you feel good about yourself is kind of . . . nice.”

The former chair has also been supportive of Trace by writing letters for him that explain his role in grant applications, and also by writing letters of recommendation for faculty positions. Trace’s department chair understood that career progression for Trace could mean leaving MedU to accept a position elsewhere.

Despite receiving support from departments and principal investigators, some assistant research scientists still encountered barriers to progressing toward their career goals. Nevertheless, they engaged in striving behavior to make themselves competitive as a faculty member outside of MedU, and to strengthen their skills to increase their value in their current position.

Striving. Even though assistant research scientists typically have an idea about the expectations of their position, as described previously, some pursued activities that aligned with their future goals, such as taking on teaching responsibilities, engaging in professional development opportunities, and pursuing independent funding. Assistant research scientists who are seeking other positions outside of MedU, or who seek to strengthen their existing value at MedU, go above and beyond expectations as they strive to achieve a tenure-track position elsewhere, or make themselves unique to secure their current position.

When talking about his future goals, Trace indicated, “I kind of have loftier goals for myself than you know, kind of sitting in somebody else’s lab.” Trace described striving behavior when he decided to pursue teaching, an activity that does not count toward promotion as an assistant research scientist:

I was looking for faculty positions, and again, you know . . . I look at my CV, and it’s like okay, I’ve got lots of publications, I’ve got lots of talks, and now I’ve got a grant. You know one thing that was missing was teaching.

Trace described how funding eligibility issues arise when funding opportunities require that applicants have only a certain number of years past completing their PhD:

So what happens is you know if you find yourself as a postdoc, you know, who’s been around for a while or transitioned to a research associate, you might want to apply for grants, but you find that there’s really nothing out there. So if you’re interested in finding your own tenure track position somewhere, there’s a strong feeling among us, among the people in the positions, that if you’re going to do that you need to have a grant, and in order to get a grant if you’ve been here long enough, you need to be in a position like these, you know, research investigator positions where you can apply for your own funding.

Trace also described taking on much of the responsibility of an assistant professor but with less pay. Trace indicated that he takes on much of these responsibilities himself:

Granted I bring a lot of these responsibilities on myself, but you know, I’ve been teaching, I’ve got a grant, you know I’m doing my own research, I’m kind of doing all of these things. I’m serving on committees, I’m . . . doing departmental service. Really the

only thing that an assistant professor does that I don't do is take on a PhD student of my own. So it's just kind of life. Why am I doing this to myself?

When Trace describes all of the responsibilities he is taking on, he seems to recognize that he is doing all of the work without the rewards that would accrue to an instructional-track faculty member. However, Trace is hopeful that his efforts will lead to a tenure-track position in the future. Trace noted the positive side of his situation:

. . . when I go on job interviews for you know, an assistant professor position, I have the ability to say look, I've been doing all the things that you're going to want your new hire to be doing, so why not take a chance on the slightly older guy . . .

Similarly, Eric stated that he is trying to find ways to make himself unique so he can continue doing what he's doing. He agreed to participate in a professional development opportunity when his chair nominated him to participate.

Sam described what getting a grant could do for his career: "If you get a big grant, you can go directly to a faculty position somewhere else, and you can be a real professorship, assistant professor level." Sam also indicated that other institutions do not have two tracks of faculty, but they have faculty positions starting at the assistant professor rank. When describing his career goal, Sam indicated, "I'm planning to submit an independent grant. See if I get the independent grant . . . I can move somewhere else, or I can be an independent scientist, or faculty." Sam indicated further that if he had an independent grant, he could be considered for the professor level at MedU rather being on the research scientist track. Sam's statement about pursuing a "real professorship" if he gets a big grant is an indication of how he may perceive his role as a faculty member at MedU to be at a lower level than his career aspirations indicate.

Overall, assistant research scientists were familiar with the expectations of their position, but the promotion process was not clear. Further, a couple of assistant research scientists described obtaining some support from the principal investigator of the lab, or from a department

chair or division chief who in one instance advocated for a raise and in another provided useful career advice. Assistant research scientists also described striving behavior by engaging in activities, such as teaching, that do not contribute to promotion criteria in their role at MedU. However, these activities contributed to the pursuit of opportunities elsewhere, and made them more unique in their current role at MedU so they would have the opportunity to continue their work.

Research assistant professors. Assistant research scientists understood the expectations of their position more clearly than was the case for the research assistant professors. Research assistant professors were split on understanding the expectations with only four of them indicating that the expectations were clear or available. The opportunity for promotion was also an important consideration for research assistant professors because obtaining independent research funding, which is required for promotion, was particularly difficult in the highly competitive and tight funding climate. Due to these differences, one of the subthemes for research assistant professors includes the opportunity for promotion rather than the clarity of the promotion process. The remaining subthemes between both groups are the same including job expectations, department or PI support, and striving.

Job expectations. Four research assistant professors indicated that their job expectations were clear, while three indicated that the expectations were not clear. Several research assistant professors indicated that the expectations required of their position were clarified through an orientation and through conversations with their boss.

Dan described learning what the expectations were for his position by attending an orientation. However, he described the orientation as being geared toward the clinical side, and “what’s known as the instructional track, so the regular tenure-track faculty members.” Dan

indicated that much less time was spent discussing the research track than the clinical and instructional tracks, although the participants in the orientation were spread among all three tracks with one to two research faculty present as well as several people appointed to the clinical track, and one or two people appointed to the instructional track.

Dan also learned about the expectations of his position through interactions with his boss. Further, Dan described an assistant dean whose job it is “to focus on people on the research track.” He met with this person after four years to discuss what would be needed to be promoted. Dan described the assistant dean’s meeting with him:

You meet with this guy, you basically go over everything, what are the requirements, he looks at your performance over the time you’ve been here, and tries to identify places where there are deficiencies, tries to help you understand what those deficiencies are and how to fill them, and is also just there as a resource that you can call whenever you need either some information or support.

Dan indicated that for him on the research track, the main indicators for performance are a publication track record and funding. He is expected to have an independent research program that is separate from the PI, along with funding for the independent research program.

Marc feels like the promotion guidelines are clear. However, he questioned whether some of the requirements are realistic given how difficult it is to get funding. Marc meets with the department chair on an annual basis to set expectations and to ensure that his career is moving forward. When it comes to promotion, Marc checked the requirements on-line, and took the initiative himself to keep moving forward. Marc explained that he likes to keep track of promotion requirements to guide his career. When discussing the possibility of changing appointments from a research professor to a research scientist, Marc expressed concern, “. . . but any of those moves in a progression of career and try to bring funding can impact it negatively,

your career.” Marc thinks that making this change can be perceived as moving backwards by NIH reviewers.

Karen described the expectations of her position to align with the work that she does currently. Karen indicated, “I think they mostly just expect you to be working at the bench but have a mentoring and teaching aspect . . .so it seems there’s no real . . . list of what you’re expected [to do], except when you’re up for promotion.”

Karen also valued the opportunity she had to meet with an administrator from the medical school. She explained, “they are actually kind of keeping track of the research faculty, and we’re not totally lost.” Karen discussed meeting with an assistant dean from the medical school:

I met with him, I think before my last promotion, to talk about what he thought about going to professor track or scientist track. And then three years after that. So two or three years ago we met again. His office contacted me just to keep track of like you know, how things are going. It was kind of like the mid-term review just to see again how things were going, but also about what I would need. And so from him asking what I prefer to do, what I enjoy, instead of teaching or writing grants . . . from that conversation we thought scientist track would also be better for me and he just went along with it.

Jason learned about some expectations for his position from orientation when he began working at MedU. He also indicated that this information was available on-line. He described his position as requiring everything that the tenure track would require, except without teaching and student mentoring responsibilities.

Brad felt that the expectations of his position for promotion weren’t clearly laid out. He asked his boss for guidance, and his boss told him that he would need one major independent grant, and publications. Brad’s boss would like him to pursue promotion early. As long as Brad can meet all of the publication requirements, he has already met the grant funding requirement, so his boss thinks he should be able to start the process early. His boss is supportive of

promoting Brad so that he can jump up the pay scale and be a research associate professor.

Brad's boss has been helping him prepare documentation in anticipation of promotion review.

Dave indicated that the expectations for his position were not clear to him. However, he was aware that publications and funding were expected. He was supposed to meet with the assistant dean from the medical school, but it had been five months and he had not heard anything about a meeting yet. He explained that this was because research faculty are "pretty much at the bottom of the totem pole." Dave believes that there will always be people available to fill in for research faculty positions.

Charles also believes that the expectations for his position were not clear. When he first started he felt that the material he read over was vague. What was clear from the faculty handbook was that Charles would be able to write grants, and that he would be eligible to teach, which was important because his boss wanted him to do some teaching to help the department. When asked if he could change anything about his position, Charles elaborated on his thoughts about the expectations of his position:

I think it'd be nice to have a little bit more direction about . . . what you should be doing, especially early on in the research track situation, like what . . . I should be doing, year 2, cause frankly, I didn't even know about this six-year clock. I had no idea. And then I got this email about my mandatory three-year evaluation, and I was like, oh, that's kind of scary. And then when I met with [the assistant dean], it was the first time, I was like this isn't just some placeholder title that I have, you know, I'm on a real track here, and you know, I didn't know any of that.

Charles continued that he didn't realize that anyone but his boss was keeping track. Charles felt reassured that there are institutional policies in place for research-track faculty. When asked how he felt about this realization, Charles responded:

I think it made me feel a little bit, you know, on the secure side thinking, well, the institution has clearly some rules and regulations, and this is something that's actively being thought about. And there's policies in place, very specific to this track, so I felt on the one hand I'm not just gonna fall through some crack somewhere, so that was

reassuring. And then at the same time, you know, there's some anxiety because he was like, well in three years, you're gonna have basically the same standards laid before you that you have to meet as an instructional-track person going up for tenure, so that made me a little bit apprehensive. And also, like, how is that even fair?

However, Charles indicated that if he does not become a PI on a grant, neither he nor his boss knows what will happen. In this regard, Charles's future is unsure.

Research assistant professors predominantly relied on others to help them to understand what the expectations were for career progression at MedU. Often this began with an orientation at the start of employment, and sometimes included accessing information on-line, but then transitioned to seeking input from a boss or department chair. A third-year review meeting with an assistant dean in the medical school either served to reassure those who met with this individual helping them to feel validated, or that they were not forgotten, and giving them the opportunity to ask questions and to seek clarification about promotion requirements. However, for those who did not receive a meeting when anticipated, the failure to have a meeting either validated a negative perception, or created one, of second-class status as Dave expressed.

Opportunity for promotion. Even when promotion criteria are clear, a tight funding climate can make it increasingly difficult for research assistant professors to achieve promotion. Some research assistant professors did not express being discouraged by the funding climate. Dan feels that promotion criteria are clearly laid out, and he believes that if he meets those criteria he will be promoted. Dan explained, "the nice thing is that the university has very clearly identified criteria, and as long . . . as I meet those criteria in the same way that the instructional track people do, . . . then I can expect to be promoted to the next level."

Karen has also not been impacted by the funding climate. When Karen participated in this study, she was in the process of switching research tracks and being promoted from a research assistant professor to an associate research scientist based on her desired work

responsibilities. She indicated that the department and MedU require that you move forward in your career. Karen explained:

We can't just stay in the same position because this institution is pushing us to continue to move up, which is a good thing, because that's why they started limiting post docs to five years right, because some people were staying for six and seven, and not because some labs would take advantage of them.

Karen also discussed the mid-term review meeting she had with the assistant dean from the medical school whose office had checked in to see how things were going. They discussed what appointment would make the most sense for Karen. The assistant dean advised Karen what she would need for the next promotion, and spoke with Karen about what she prefers and enjoys to do. Karen also discussed promotion with her boss. They mutually decided that it would make the most sense for Karen to pursue promotion as a research scientist rather than as a research professor. Karen explained:

I'm switching to the scientist track, and the main reason is . . . if you continue in the research professor track, they expect you to have large grants, like an R01 or something, which I'm not quite sure why you wouldn't just go for the tenure track if you were going to be writing for big grants. The main point is I want to stay doing research, mentoring people in the lab, you know, being like a hands-on person. And so we think switching to a scientist track makes more sense for me.

Because research scientists appointed at any level are not required to have independent funding, the funding climate did not impact the opportunity for Karen to be promoted. However, had Karen remained in the research assistant professor role, based on her level of research funding, she would have not been eligible for a promotion. Karen noted that a promotion for her is really a title change, which does not affect her day-to-day work.

Dave also thinks of promotion as a title change, and promotion is not important to him. He figures that eventually he'll get a "nudge" to submit a promotion package in a year or two. However, Dave has very little motivation to pursue a promotion. He stated, "I'm not really

enthusiastic, that's just a title really. I don't really care. It doesn't have much substance, you know." Dave also described his career choice as a sacrifice to support his spouse's career.

Marc, Jason, and Charles all described needing to obtain research funding to be eligible for promotion. Marc needs to obtain his own grant to be promoted. However, this has been difficult. After submitting a grant proposal that was not funded two or three times, Marc submitted it as a co-investigator with someone else who was better positioned as an instructional-track faculty member to be the principal investigator. Even though the grant was funded, and the idea was Marc's, he will not get credit for the grant toward promotion. The absence of independent grant funding is holding Marc back from a promotion. Marc explained:

I can be between the next level and the following level based on the recommendation [reputation] that I have, nationally and internationally. However, funding is a thing that we are starting. I have my money, I have. I really work the system in the way that I can you know, have people working right now in my lab. This next two years are critical for me for NIH grant, and my first submission is coming in a couple of months. So my question, what will happen with these two [grants]. It worries me.

Marc explained that he is unable to move forward in his career without having a grant funded.

Jason indicated that the research-track promotion process is clearly laid out. However, he described getting a promotion as a catch-22:

You get a raise, and then you have to get more grants . . . since you have to pay for yourself. It's . . . nerve wracking, right. So I know we just went through this period where funding . . . was dropping off, and we didn't get things to fill in quite as quickly as we wanted. Things are starting to fill in, so that's good. But it's hard to ask for a raise in that situation. And at associate professor, that's what you're gonna get, a raise with that.

Jason stated further that the tracking of research faculty is not one hundred percent. He explained: "So, I was supposed to have a three-year review, which never kind of happened." There was some transition in leadership in the department, and Jason indicated that he "didn't keep on top of it." However, Jason also indicated that the department has been supportive. He explained, "[t]he department's been incredibly supportive, and given me everything I've wanted,

but hasn't given me quite as much guidance." Jason continued, "[My boss] is not the kind of person who's gonna tell you exactly what to do. You have to kind of figure it out yourself, and I think that's fair. It should be my responsibility in some ways." Jason has been "pushing" on scheduling the review meeting.

Charles was contacted by the assistant dean at the medical school for a three-year review.

Charles summarized what he was told:

'for you to become a research associate professor is no different than an assistant professor getting tenure. To associate professor we're gonna look at the exact same criteria, and . . . you have essentially the same expectations.'

Charles continued, "and he said, 'unfortunately for you, teaching doesn't help you. It helps them, but it does not help you on the research track'." Charles indicated that he needs to be a PI on a grant, which is the criteria that he will need to meet, along with publishing and contributing to the research endeavor. If Charles does not obtain independent grant funding, he will not meet promotion requirements.

MedU provides the opportunity to change tracks if a research-track faculty member does not meet the promotion criteria to be promoted. Dan explained, "if you are research assistant professor and you don't manage to get to research associate professor for some reason, funding or some other reason, then you can be moved over to the research investigator [track]." Dan continued, "and if I move, if I don't succeed this way here, I move over here, but I can still advance. The advancement and the criteria for advancement are different." Unlike research assistant professors, research investigators are not expected to have independent funding.

Although there is flexibility within the research track between research scientist and research professor appointments, there is not similar flexibility between the research track and the instructional track, or tenure-eligible track. Jason indicated that he would probably need to

move out of the department to switch to the tenure track. He continued, “. . . but usually what would end up happening is I would have a grant and I’d just . . . get it positioned somewhere else, or an offer somewhere else.”

Independent research funding is not of concern for research assistant professors who do not aspire to be promoted. For these faculty members, in the absence of obtaining independent funding, switching tracks to align with their research productivity is a feasible option. This would mean transitioning from a research assistant professor position to an assistant or associate research scientist position depending on their productivity.

However, for those research assistant professors who wish to progress in their careers within the research professor track, if they are unable to secure independent funding, then they will not have the opportunity to be promoted within their current track. On the other hand, if a research assistant professor is able to secure independent funding, this not only paves the way to be promoted as a research associate professor at MedU, but it also provides a potential opportunity to secure a tenure-track position elsewhere.

Despite the difficult funding climate and the requirement that research assistant professors obtain independent funding to be eligible for promotion, research assistant professors described departments as being supportive and committed to their success.

Department or PI support. Several research assistant professors indicated that the department has been supportive and helpful in ensuring their success. For example, research assistant professors indicated that departments have encouraged activities that research assistant professors wished to pursue, such as teaching, by encouraging promotions when possible, and in one case by ensuring that a research assistant professor had the opportunity to serve as a lead author on publications.

Dan described the department as supportive of all faculty. “Now the department as a whole has the commitment, and I think it does a fairly good job of fulfilling this commitment to make sure that people who are on the instructional track and on the research-faculty track have the support and commitment from the department to make sure you are as able to be successful as possible.” Dan continued, “I also think it’s a commitment on a part of the institution that understands that you really do need to help people.”

Charles indicated that his boss, who is a well-funded department chair, has been very supportive. His boss has been promoting him regularly, and he’s giving Charles opportunities to do things, like teaching. When Charles expressed that he enjoyed teaching, his boss supported him teaching students in another school at MedU. However, Charles’s boss believes that a person can only be a lead author on a publication when that individual is the PI of the grant that funded the work. Charles explained:

I love my boss, so I don’t take issue with [him being lead author on his grants]. But . . . the only way you’re gonna get senior authorship in his world is if you get a grant and you use that grant’s resources to do all that work, then you can be senior author. Which is more or less impossible in his laboratory to do that.

In contrast to Charles’s boss, Brad’s boss has been intentional about making sure that Brad has the opportunity to be the lead or senior author on papers, which can be important to obtain independent grant funding. When Brad’s boss recruited him to MedU it was with the understanding that they would be research partners. Brad stated, “so . . . working with [boss] . . . which I can’t say enough about him and thank him enough . . . He really wants to make sure that I do well.” Brad’s boss enjoys doing research, but because he is at the end of his career, it is not his goal to obtain all the credit, but to make sure that Brad is recognized. Brad explained, “so you know, even when he [boss] deserves credit for stuff, he doesn’t really accept it a lot of the times,

but I mean I always say [boss] did this or that, but . . . that's how he is, and then I think it makes you want to work harder for them then.”

The department has also been supportive of Jason. When Jason requested to have his annual review completed by the department chair, his request was granted. Jason explained:

But the first few years here, you know, I am considered faculty, . . . but I wasn't reviewed by the chair of the department. [My boss] would . . . tell me if I was doing good or bad, or keep your eye on this, you know, but I wasn't . . . having a connection with the department quite as much by connecting with the chair. . . . As long as the PI keeps on stamping “yes” keep this person on, we're fine, you don't need to talk to anyone in the department. So . . . what that does is separates that person from the department activities. And so I think now that . . . has changed. I'm supposed to have a . . . sit down with the chair.

Karen thought she would need to wait eight years to be promoted, but her boss moved forward with her promotion request after six years. Karen's boss suggested she apply for promotion earlier as a way of recognizing Karen and rewarding her for her work. Jason also described his boss and the department being supportive of his career by understanding that even though his he is expected to do research, he prefers to expand his role by engaging in additional activities, such as teaching and service.

Although individuals in the department are unable to guarantee a research assistant professor's success, they can ensure that research assistant professors feel supported and rewarded by listening to their goals and needs. Research assistant professors felt supported when they were encouraged to engage in activities that interested them, such as teaching, when they had the opportunity to be the first author on publications, when they were promoted as a way of acknowledging their work, and when they had the opportunity to strengthen their connection to the department through the annual evaluation process.

Research assistant professors are often working toward a future career goal, such as a promotion or obtaining a tenure-track faculty position. Pursuing either of these career goals requires stamina and continued effort, which leads to the next subtheme, striving.

Striving. Several research assistant professors discussed striving to move their careers forward, whether through promotion or through working toward a future goal of obtaining a tenure-track position. Future success for all of them means being able to acquire independent funding.

Brad is motivated to move ahead in his position at MedU. He is taking deliberate steps to maximize his future success. He described the “street smarts” needed to get ahead:

I’m very interested in like pushing. What do I gotta do to get promoted, and what do I gotta do to go ahead, and what do I gotta do in these societies . . . I’ll be like, you need to talk to this guy, and this person, and blah blah blah, and you know, when we go to conferences and meet all of these people, and they’re all people in the end who are going to be reviewers on grants and big people in the field, and there’s a lot of street smarts to this game.

Brad was recruited to head up a program at a liberal arts institution. Brad had a friend at the institution who assured him that the position would not be too much work. However, it is Brad’s goal to “be one of the big people” in the field. Regardless of his title, Brad believes because of the people that he has the opportunity to work with, that his position at MedU is giving him the opportunity to reach this goal.

Jason talked about “shopping” around a couple of grants if one gets funded. If one gets funded, Jason would be more competitive for tenure-track positions at other institutions. Although Jason is happy with his position as a research faculty member, if a tenure-track faculty position came along, he would take it. However, before such an opportunity can arise, Jason will need to obtain independent funding, a goal toward which he continues to work.

When asked if he could change anything about his work, Dave expressed a desire to do his own independent research. He would like to receive his own funding from the NIH, which continues to be a goal toward which Dave is working. It has also been Charles's goal to obtain independent funding, and to have his own lab. Charles explained, "so I've been amassing R01 type preliminary data . . . so I've been strategizing to do that. And so I think there's nothing really holding that up." Marc indicated that for him to be promoted, he will also need to obtain his own grants. At the time of our interview, Marc was preparing four different grant applications to the NIH, including three R01-type applications.

As long as research assistant professors are working toward a goal of obtaining independent funding to support their careers, whether working toward a promotion as a research associate professor or to obtain a tenure-track position elsewhere, they continue to put an extraordinary amount of effort into pursuing their goals.

Summary, theme 4: career and promotion. The promotion process was less clear to assistant research scientists than to research assistant professors, while the expectations for promotion were less clear to research assistant professors. Both groups of faculty turned to others for support, such as to a mentor, principal investigator in the lab, or to a department chair or division chief, or to other resources at MedU for information, such as on-line or through information conveyed at faculty orientation. Both groups of research-track faculty engaged in striving behavior with assistant research scientists taking on additional responsibilities, such as teaching, to work toward career goals that differed from their current role,

Despite the support that research assistant professors received from others, the opportunity to be promoted was very uncertain due to the difficulty associated with securing independent research funding. Both assistant research scientists who wished to do independent

research or pursue a tenure-track position elsewhere, and research assistant professors with the same aspirations felt pressure to obtain independent research funding, and through striving behavior, to take on additional responsibilities, such as teaching, to be competitive for other positions. Engaging in professional development opportunities to acquire unique skills to enhance their value at MedU was another strategy an assistant research scientist pursued. Research-track faculty members may have engaged in striving behavior in response to a lack of job security.

While failing to secure independent funding will not prevent an assistant research scientist from being promoted to an associate research scientist, the failure to obtain independent funding will prevent a research assistant professor from being promoted and moving forward in their career.

Relationships also play an important role in the work of research-track faculty. Research-track faculty who do not have independent funding rely on collaborations with others by working on their funded grants as a way of covering their salary. The quality of interactions with other also impacts whether research-track faculty feel recognized. Collegiality is the subject and title of the next theme.

Theme 5: Collegiality. Relationships with colleagues provide opportunities to collaborate on projects and to make connections with other experts. Collaborations can be particularly important for research-track faculty because collaborating on grants provides another avenue through which research-track faculty, who are required to fund their own salaries, are able to obtain funding by working on funded grants of others.

Research-track faculty members appear to be perceived differently inside MedU than externally. External colleagues, such as former mentors and classmates, new colleagues, and

grant reviewers often form opinions about what it means to not have a tenure-track faculty position, while internal colleagues better understand the research-track faculty role. For theme 5, collegiality, I have included the subthemes collaboration, recognition, and external perceptions for both assistant research scientists and research assistant professors.

Assistant research scientists. When asked about collegiality at MedU, assistant research scientists expressed that the environment at MedU is collegial. Assistant research scientists feel that they have the opportunity to build collaborations. Although assistant research scientists generally felt recognized at MedU, they were more likely to experience a lack of recognition from external sources such as from colleagues, grant reviewers, and sponsoring agencies through eligibility requirements.

Collaboration. Assistant research scientists have the opportunity to build their internal network at MedU, though this takes personal initiative. A couple of assistant research scientists indicated that building their network is up to them. Graham believes that he has the opportunity to network and to build relationships if he makes the effort. Graham explained:

The med school is big too. It's huge. Very competitive. It's crazy, I mean like very very specific. It's hard to have even a friendship with somebody you know, like in terms of collaboration, sometimes it's very formal. Anyway, . . . the few that I have I think are good. I can definitely do more networking.

Trace also works to build his network. He described his collaborations in the context of wishing to stay at MedU if it were possible to obtain a tenure-track position there: "I have colleagues here who I'm collaborating with . . . , and there's new people who have come on board who I've talked to . . . should I ever get my own, you know, independent work really going. There are people I have already . . . talked to about collaborating in the future."

Although Lisa did not talk about making specific efforts to build her network, she described her boss as being very supportive of teamwork, which has brought the opportunity to

engage in collaborations. Eric also indicated that he is “able to build good relationships with people.” Sam indicated that he also collaborates with others outside of his department, and he described these collaborations as positive.

When talking about relationships with others at MedU, assistant research scientists described these relationships in positive terms. They have not felt like they have been treated differently because of their status. Jay has not experienced a lack of collegiality due to his appointment as a research-track faculty member. Jay explained:

I have not had the experience that a professor did not want to work with me because I am a research faculty member. I have not had that experience. I wondered if it would happen to me when I took this job, but it has not happened to me.

Trace feels comfortable interacting with colleagues as a fellow scientist:

There are several people in the department who are doing research completely unrelated to my own that I just think is really neat. So I’ve always kind of talked, even as a post doc, . . . to them about it. And I’ve never really had a big problem being treated as just you know, another scientist, just a colleague.

There are also faculty members who attend Trace’s research talks who then become familiar with him and him with them providing an additional opportunity to interact with others.

Graham described the PI of the program in which he works as “amazing.” They have an excellent working relationship. Graham’s primary position is now in a different school, but Graham is still a resource for the PI, and this makes him feel like he can contribute. For example, the PI, who is also a department chair, asks Graham to help with interviews when new postdocs are being hired. Graham described feeling like a resource, “I know what she’s looking for, and so it feels good. You know, it feels like it’s still a connection.”

Even though establishing collaborations takes effort, assistant research scientists felt that they have the opportunity to develop collaborations if they make the effort. Assistant research

scientists did not indicate that their research-track faculty status impacted their treatment at MedU. Rather, they expressed feeling treated as a colleague by others at MedU.

Recognition. For the most part, assistant research scientists explained that they have felt recognized at MedU in different ways. Many different events can provide a sense of recognition to assistant research scientists, such as by receiving a grant, being nominated for an award, being asked by students to participate on a committee, or even by receiving a promotion-clock extension or promotion. In one instance where an assistant research scientist did not feel recognized, he described being excluded from participating in some interactions with industry. Ultimately, the industry partner was able to facilitate this assistant research scientist's participation in the training activities that were taking place.

After initially being excluded, Eric felt recognized when a company came to MedU to do some training. Eric was not invited to participate in the training in the beginning. However, because of Eric's publications, the company requested that he be included in the training. The company recognized Eric's work, but didn't realize that he was needed to participate until later in the process. When asked about being excluded, Eric stated, "I tend to ignore that. You know, . . . it's a little bit of frustration because they should know better. But when they realize that I can give them more, then I start to get included."

When Trace received a grant, the department chair made a point of recognizing this achievement at a department meeting by telling Trace to tell everyone the score. Trace explained, "he just kept saying, 'tell them the score, tell them the score.' So finally I had to tell them and you know, everyone was kind of oohing and ahing, and it was kind of nice."

Trace also felt recognized when he was nominated for a research award by his department, and when some students asked him to be part of a committee for a career

development workshop. When talking about the students and the career development workshop,

Trace indicated:

. . . for one year they were trying to find people who were at, you know, different career paths, and kind of career advice type thing. They asked me to be on that committee, which surprised me, honestly. Because again, I didn't think that many students were even aware of who I was, and yet they wanted me to be part of that.

Even though Trace did not indicate directly that he feels invisible, his statement that he did not believe that many students were aware of who he was reflects this possibility.

Nevertheless, Trace also indicated that he felt recognized by colleagues when he attended research meetings. He compared how he felt as a post doc to how he felt as a research-track faculty member:

So during that period [post doc period] it was a lot harder . . . there was a general sense that you didn't as a post doc necessarily get a lot of like real official kind of recognition. But in this position with research faculty, I think a lot of it stems from the fact that, you know, I now go to faculty meetings, right, so it's like they know you, your face is there every week, and they . . . come to know who you are. And so you present your research there . . .

Students were a source of recognition for Eric when they recognized him by nominating him for a mentor award, which he received. Clinicians also recognized Eric's group as the top clinical program of the year which brought about additional recognition. When asked about a time that he felt recognized in his job, Graham described feeling recognized when he needed a promotion-clock extension, and "many people went the extra mile" to make sure that his extension happened. He was very appreciative of this added support and felt recognized by MedU as a result. Jay and Sam also each felt recognized when they were recommended to receive promotions.

Perceptions of colleagues outside of MedU, such as previous mentors and classmates, and new colleagues as well as grant reviewers can also impact whether assistant research scientists feel recognized.

External perceptions. Assistant research scientists described instances where they felt that their role or title was questioned by colleagues or grant reviewers outside of MedU. Others outside of MedU seem not to understand the role of a research-track faculty member.

Trace indicated that grant reviewers perceive research-track faculty positions as problematic when scoring grant applications. When asked what he meant by that, Trace explained:

Unfortunately the science is such a small part of what you have to. spend your time putting together, so there are a number of places, in the biosketch for example. I mean the very fact that you have to put in your position title, if you're not assistant, associate, or full professor in that slot . . . it immediately raises the question, what is that?

Eric also described perceptions about his position from grant reviewers:

Don't get me wrong, I've been successful . . . if I put names and support, they acknowledge that, but they always . . . have to comment about my position and my role and my credentials . . . In all the grants there is always a comment.

When asked how Eric felt about this, he continued:

. . . you try to do your best, and you have proof, right, that you're successful in something, and because you don't follow their steps, they put a big question mark. And it's a lot of frustration.

Graham explained how colleagues reacted to his decision to continue at MedU as research-track faculty after completing his post doc, "mainly actually, when I go, and I, you know, meet friends in conferences, they ask me, and they kind of worry. They look like okay, but are you okay with that? Like you know, I say so far so good. I'll let you know if I'm not, and many of these people wrote letters for me, so you know." Graham elaborated further during the

second interview, “they kind of look at the . . . title component, like not necessarily what I’m doing . . .”.

Assistant research scientists expressed that they have the opportunity to collaborate with others at MedU, and they described being reasonably respected. However, they felt that their position and title were questioned by others external to MedU. Grant reviewers sometimes questioned their independence and qualifications making obtaining funding more challenging. Colleagues at conferences sometimes also questioned their status.

Research assistant professors. Research assistant professors, like some assistant research scientists, indicated that they have the opportunity to develop new relationships and collaborations. They described the environment at MedU as collaborative. Although some research assistant professors stated that they felt recognized at MedU, there were others who did not feel the same way. Perceptions of others, such as colleagues, grant reviewers, and funding agencies also came up as a negative aspect of working as a research-track faculty member.

Collaboration. Research assistant professors described MedU as very collaborative where they have the opportunity to develop relationships, and where department chairs are accessible. Dan described faculty who have been in the department for a while as “the old guard” which “was more hierarchical.” He also indicated that this group tends to be very accepting of research faculty. However, he described the newer faculty coming in as “a little more flexible.” He continued, “[t]hey’re coming in with having been in places where the approaches are different and the ideas are different. And so there is a lot of emphasis on the idea that . . . there is just a lot of stuff we need to get done and these people are here, and they can help.”

Dan indicated that you have to be willing to develop your own relationships, and that when you do this, the relationship is “very much the same” as if Dan were a regular faculty member.

Marc indicated that he has access to the department chair and others in the department when needed, “. . .but the door is open everywhere. . . . I have availability 100% from any of those guys if I need to approach them.”

Brad described MedU as the “most collaborative place” he has ever been. When comparing MedU to another institution where Brad completed some of his postdoctoral work, he described the other institution as one where teams worked separately. He described his thoughts about his experience with collegiality at MedU:

I’m always so skeptical. And so I’m here, and everyone’s sort of so friendly and collaborative. . . .but then I was hesitant, still thinking alright, I’m just waiting for one of these guys to screw me over or something, you know, because I’ve experienced it before. And so far I haven’t had anything. They’re very friendly, very willing to collaborate.

Karen’s department has been making an effort to bring people together from different labs in the department. The department has a tea where people can come together for refreshments. However, Karen indicated that many people still spend time with people they know rather than branching out. Concerning her boss, the PI of the lab, Karen indicated that during group meetings, people in the lab are free to contribute ideas, and the PI is receptive.

Jason indicated that he likes all of the faculty members in his department, and he feels that everyone treats him like he’s “in the mix.” Jason explained in comparison to his previous institution:

. . . this faculty is very supportive. They’re no nonsense, you know. In other situations I felt like I was just an observer in the faculty meetings. Here I feel like a participant. So I feel like . . . people are interested in hearing what you’re doing. You’re immediately accepted as part of the group.

When asked about what was different in the environment in his department at MedU, Jason explained how the department chair accepts feedback from faculty members at the meeting. Jason indicated that he is comfortable making comments, and has done so during meetings.

Dave described his department at MedU as “very collegial, very supportive of each other” and as a “very nurturing place.” Dave said that there are a lot of resources available to help with grant applications and publications. Dave recognized that people are open with each other about their research. He described lab meetings with another lab where they openly share and discuss all of their scientific data. Dave explained:

without cherry picking, because for publications or other presentations people tend to showcase the best scenario, right, and there has been a lot going on behind the curtain. But at our lab meeting, we discuss everything, just the raw data. I think that’s actually how true science comes through. It’s not always pretty. It requires a lot of fine tuning until you get the very clear message, . . . without any doubt or ambiguity.

Although research assistant professors portrayed the MedU environment as collegial, and they felt respected by the faculty at MedU, feelings of recognition at MedU and perceptions from external colleagues were less positive.

Recognition. Several research assistant professors described experiencing recognition through some practices at MedU, such as posts of accomplishments for all tracks and ranks on a website, through department chair interest in their viewpoint, and through a bonus for one research assistant professor that was provided by a department chair with discretionary funds. However, some research assistant professors also expressed not feeling recognized.

Dan indicated that accomplishments are posted on the department website for all faculty as well as post docs and graduate students. However, Dan described himself as a “blue collar” scientist. He continued, “I know the experiments, I know where to go, how to do them, and produce fairly good high-quality data, but I’m not the shining star that other people see.”

Dan described efforts that are being made in his department to include research-track faculty in the department. The chair of Dan's department has been in this role for several years. She has been making efforts to engage the research faculty in the work of the department, which could increase recognition of research faculty. Dan explained:

She had not been in charge very long when she convened a meeting of the research faculty members, which was me and two or three other research assistant professors and then research investigators in which she wanted to solicit our feedback in terms of how we felt about what the department was like and what we felt our roles could be and things like that. And that was I think in response to the fact that she had this group of people who were fairly experienced, and who had a lot of interest in being more involved in the work of the department, and she wanted to figure out how to do that.

Research assistant professors describing receiving recognition after having grants funded, or by successfully having manuscripts published. Brad described feeling recognized by his department after being awarded a couple of federal grants. Subsequent to receiving the grant funding, he was chosen to receive one of two available generous bonuses. Brad explained that when some of the big surgeons grumbled, they were reminded about the grants Brad had successfully had funded that were equivalent to \$2.5 million in funding. The department chair has also recognized Brad by sending out an email announcing his successes with conference papers that were recognized at a conference as outstanding papers. The department chair emailed Brad personally to congratulate him on his grant success, and he also sent him a personal card to his home to congratulate him as well.

Charles explained how he feels satisfaction by publishing papers, which is another way of being recognized:

I think the satisfaction lies in the notion that . . . scientists know who other scientists are primarily through their work, for example. People might know me because of my work, and so having my name out there in publications consistently is satisfying in the sense that I know I'm keeping my name out there.

Charles indicated further that he receives recognition in the department through running one of the journal clubs in the department. Charles also stated that “if you’re proactive then you can be respected and recognized in the department.” Charles makes an effort by hosting speakers in the department. As the host, he introduces the speakers and is recognized that way. Charles indicated that he has “street cred” for bringing in good speakers.

In contrast, Jason considers himself to be “under the radar,” but he stated that this is alright with him. Concerning opportunities to be recognized, Jason indicated that the level of what is required to get on the congratulations list is very high, such as a publication in the most prestigious journal, or appointment to a committee. Jason indicated that he does not take this as a bad thing. However, Jason also explained that his boss shows him respect by being receptive to new ideas:

I’ll bring something to him and talk to him about something, some idea I have, and he’ll say, ‘yeah, that’s a great thing, . . . you know, why don’t you give a talk in the lab meeting about what you’re doing and we’ll discuss it some more. And so it really is more of a . . . collaborative brainstorming type of thing, which makes you want to think more, right. It makes you want to sit down and not immediately dismiss your kind of crazy ideas.

Dave stated that he does not feel recognized in his position. He indicated that recognition comes from being the last author on a paper, and not from the institution itself. Dave described himself being treated as an “appendage.” Dave came to MedU with a spouse who was recruited to the tenure track. Although his spouse was provided with a signing bonus when she accepted a position at MedU, Dave was not provided with anything. This made Dave feel not very valued. He also has the sense that people are readily available to accept research faculty positions, so he believes that the institution puts its resources into the tenure-track faculty rather than into the research faculty.

Even though Dan indicated that he does not feel that there is a stigma attached to being a research-track faculty member at MedU, he had mentioned as we walked together to the interview site that research faculty sometimes feel like second-class citizens. When I followed up on this comment during the interview, Dan mentioned that research faculty members have little input into departmental decision-making.

Dan described an additional concern that can lead to feelings of second-class citizenship as a faculty member. “There is kind of a second-class citizenship for research faculty in some respects. Many of the requirements for research faculty in terms of your position here are the same as for instructional track, but we don’t get as much representation on the department level and higher.” Elaborating on his overall perception of his status as a research-track faculty member, Dan indicated:

In general I think I’m reasonably well respected by the instructional-track faculty here. I’ve been given all the opportunities that I wanted as a research faculty member here. I’ve got all of the resources that I need. You know we all have the same access to what needs to be done.

Dan also stated that he does not feel that he competes with instructional-track faculty from a disadvantaged position. Dan associates feelings of second-class-citizen status to a lack of representation of research-track faculty in governance.

Marc indicated that in an environment when there is tenure and non-tenure, this defines two separate populations. Marc continued, “unfortunately, apparently the tenure position is one step forward, and this is unfortunate. Unfortunate, because if you have . . . tenure you show that apparently . . . you are a great investigator. And when you compare with someone who is not tenure, it does not reflect the same.” Having two separate populations can have the effect of considering members of one population to be less successful or qualified than members of the other group.

Karen indicated that sometimes research faculty are perceived as less than their tenure-track counterparts when it comes to governance:

People joke, like who cares about the research faculty. But I think there is something to that. It's not like we'll make a huge splash in terms of decisions or anything like that, and I think we are probably invited to participate in candidate searches and things, but I . . . don't actually know how that works because I haven't been asked to be on a search.

Dave described a sense of a bias toward research faculty, that they do not have the same high regard compared with instructional-track faculty. When asked what gives Dave this perception, he explained, "in general people think that this is just a transitional phase of your research trajectory. You should not stay on the research track for an extended period of time. Otherwise, they would deem that as not being productive enough, or not doing enough." Dave also indicated that if you don't have funding, then you don't have much say.

Charles also feels that research-track faculty are perceived differently than instructional-track faculty. Charles explained that resources are available to both instructional and research-track faculty, but he continued, "but I do think you're not . . . viewed as the same. You're less senior than the assistant professor on the instructional track. I think there's no doubt about that."

Charles described research faculty as "lower on the totem pole." However, when asked to identify specifically why he felt this way, he indicated that people know who is on the research-track and who is on the instructional-track. He also indicated that he gets paid a lot less, and that he essentially does the same amount of work. Charles described an experience at the institution where he completed his Ph.D. that could shed some light on why Charles feels lower on the totem pole. Charles explained:

. . . when I was in grad school there was a guy. I mean it was just you know, fate having a sense of irony. So this guy worked for the chair of that department . . . where I was doing my Ph.D., and you know, we all kind of called this guy like a permadoc, and we made fun of him . . . who is this guy who doesn't have his own lab . . . he's been in this guy's lab forever, and yeah, I mean, that's what I am right now. I mean it's kind of funny now

that I look back on it. But you know, I don't know that anyone chooses this path. I think you just end up here.

However, Charles also indicated that he does feel respected by the faculty in his department. He explained, "I feel like the faculty respect me in our department . . . I feel viewed as a colleague, even though I'm not necessarily on a level playing field." Charles provided further, "a lot of the faculty here . . . come to me for advice, or they recommend their students come to me for advice. Or I'll be on . . . thesis committees. I just feel like intellectual interaction that makes me feel like I'm on equal footing with those faculty, so that's what I mean by that."

Brad also feels respected in his position. He explained, "no one's really treated me disrespectful because of the position. I've heard stories. I think it's the people you know, they'll say they're talked down to or they're treated like second-class citizens because they're a research professor, but I haven't experienced any of that."

Even though research assistant professors expressed feeling respected at MedU, many indicated that there is a perceived difference between members of the research-track faculty and members of the instructional track. Even though research-track faculty seem to be treated with respect at MedU, and they have access to the same resources to complete their research, there is still a perception that research-track faculty have a lower status than instructional-track faculty. Some assistant research professors attributed a difference in status to the opportunity to participate in governance at MedU. A more general perception of lower status could be related to perceptions of others external to MedU who view research-track faculty positions in a lower regard than tenure-track positions.

External perceptions. Brad indicated that he feels that there is a stigma associated with being research faculty. When asked to elaborate on this, Brad stated that his status comes up at conferences where he interacts with people from departments that traditionally have tenure. Brad

feels respected at MedU. Brad explained, “To tell you the truth, at [MedU] I’ve never run into any of that. Everyone has treated me like an equal.” Now that Brad has received a couple of grants, people have been congratulating him.

However, Brad didn’t sense a stigma at the last conference he attended in his small specialty field where everyone knows everyone:

so they knew me sort of growing up through graduate school and post doc. So now that I’ve got my own lab everyone like last year at our meeting . . . it was different the way people treated me. It was like . . . I didn’t feel accepted before, but now was like almost I’m one of them. It was like now we’re like more equals not like you’re a student and I’m a mentor, . . . it was more like we’re on the same playing field now. So no one’s ever asked me, ‘oh you’re an assistant research, no one’s ever asked me that question except for students that are going to try to apply for positions.

Brad’s situation is unique in that his mentor is sharing the lab equally with him. He is able to think of the lab as equally his own, while no other research assistant professors had this experience.

Marc described how having a non-tenure track position impacts perceptions outside of the institution: “The reality outside is saying if you are tenure, you are better than someone that is not tenure, and it’s not the reality inside.” Even though Marc does not feel like having a non-tenure track position affects his treatment or opportunities at MedU, this is not the case externally.

Charles described his job situation as “pretty ideal,” with the exception of the issue of getting grants due to his status, “I think the main thing is that outside of the institution . . . how you’re viewed and how you’re able to get grants is the real problem. There’s a real area that’s not ideal.” Charles discussed a strategy of removing the word “research” from his title in his grant applications as a way of managing the independence question during the grant review process. He explained:

the truth of the matter is that the grant's . . . supposed to be mainly scored on the scientific merit and the resources, and you know a lot of other things, the investigator and blah blah blah. And questioning the person's independence isn't really a criterion for whether a grant should be funded or not, but it clearly has a big impact.

Even though research assistant professors have the opportunity and resources available to compete for grant funding, having a research-track faculty appointment seldom goes unnoticed.

Summary, theme 5: collegiality. Research-track faculty indicated that they work in a collegial environment where they have the opportunity to develop positive relationships and collaborations. There was no indication that research-track faculty felt like they were treated differently than instructional-track faculty members by colleagues at MedU.

Research-track faculty members expressed feeling recognized at MedU through award nominations, a request to participate on a student-planned committee, through department websites, meetings, and communications, through service, and also by publishing and successfully having grants funded. However, recognition was perceived as lower by some who described the opportunity to meaningfully participate in governance activities as lacking for research-track faculty, particularly given that many of MedU's requirements for both tracks are the same.

Despite describing a collegial and supportive environment at MedU, research-track faculty, and research assistant professors in particular, indicated that the perception of a research-track faculty member is not the same as that of an instructional-track faculty member. A research-track faculty member may be perceived as holding a temporary position, as being less senior, or as having less qualifications than someone on the instructional-track by those external to MedU. It is particularly challenging for research-track faculty to overcome these perceptions when applying for research funding in competition with tenure-track faculty.

I cover governance in detail for Theme 6 below.

Theme 6: Governance. MedU bylaws define the executive faculty inclusively and include all faculty tracks consisting of instructional, clinical, and research tracks. The bylaws require that each department function under the leadership of a chair, and that each department be organized in such a way as to assure meaningful participation of the faculty in departmental governance. The bylaws require that each department have an advisory committee to assist the chair and to facilitate input into departmental affairs. However, the composition and structure of the advisory committee is at the discretion of the chair. The bylaws require further that regular meetings be held that foster meaningful participation of the faculty.

Participation is the sole subtheme I identified under the governance theme, which applies to both assistant research scientists and research assistant professors, but in different ways. Assistant research scientists participated less in department meetings than research assistant professors. However, even though research assistant professors expressed a higher level of participation in faculty meetings and governance activities than assistant research scientists, active participation was still at times constrained.

Assistant research scientists. Most assistant research scientists indicated that they feel that faculty meetings are not relevant to their work. For this reason, many made the decision not to participate. By not participating in faculty meetings, assistant research scientists have even less of an opportunity to engage in governance activities than their role as research-track faculty permits.

Participation. When asked about participating in governance opportunities, Graham indicated that he felt that he was wasting his time. He described participating in faculty meetings as irrelevant. Graham described his experience with attending a faculty meeting, and having a

discussion with the department chair. When asked if people listen at the department meeting, Graham responded:

It doesn't matter if you listen or not. You show off. They know you exist, but if I have a grant I don't even need to speak. That's the thing. I felt like okay, you can be at the table, but you know, when I was looking for jobs I spoke to the chair there and tried to have some support for changing fields, and I didn't feel like I was even listened to.

Graham continued, "I felt like I had to prove that this was useful, and in many cases, I don't want to prove anything . . ."

Trace also indicated that department meetings are not relevant to him. He explained:

. . . for the most part, like if I'm trying to get my own position elsewhere, it's good to know how a department works, but I don't have a horse in this race. Right now we're trying to find a new department chair. I don't really necessarily feel like I need to go to the meetings because it's gonna happen one way or the other.

Trace also stated that he has an opportunity to vote, but he continued "it doesn't really matter to me, because you know, my goal is . . . to leave, to put it bluntly."

Sam also described department meetings as not being relevant to him. Meetings are often focused on the clinical side of things. Because these meetings do not concern research, Sam does not attend. Lisa also indicated that mostly tenure-track faculty members attend department meetings, and they talk about "clinical stuff."

Eric described more substantive involvement in department meetings. He stated, "I go to the ones [meetings] for more like large impact, like curriculum, like medical school curriculum." Eric also attends the faculty retreat that is held bi-annually. However, decisions are not made at these meetings. Eric described these meetings as more informative, whereas decisions are made "more with the university." Eric did also mention that he has the opportunity to help with decision-making by participating on a search committee for a program director.

Five of the six assistant research scientists indicated that they often choose not to participate in department meetings because they are not relevant to them. Relevance was associated with the content of the meeting, or with the long-term goals of the faculty member. For example, when a department meeting had a clinical focus, assistant research scientists described this as not relevant to their work. On the other hand, for an individual who was looking to leave MedU, department meetings were also deemed to not be relevant.

Research assistant professors were more likely to participate in faculty meetings. However, some of them indicated that meaningful participation in governance was constrained due to their status as a research-track faculty member.

Research assistant professors. Several research assistant professors described participating in faculty meetings and having the opportunity to vote. However, governance activities are left to the discretion of the department. Even though meaningful participation is expected for all members of the faculty, actual practices are managed at the department level.

Participation. When asked about a comment that Dan made about research faculty sometimes feeling like second-class citizens, Dan indicated that because of the way that university departments are set up, it is the instructional-track faculty who participate in making decisions, and not the research-track faculty. Dan gave as examples that research faculty do not have input when new faculty members are hired, or when departmental decisions are made concerning new research initiatives. Instructional-track faculty members also make the decisions concerning the hiring or promotion of research-track faculty.

Even though instructional-track faculty has traditionally been the group that has been responsible for governance at the department level, changes are occurring that could give

research-track faculty a more meaningful role in governance. Dan described a research faculty member who made an effort to incorporate research faculty into departmental governance.

There was one of my colleagues who is a research faculty member. He came here with one of our recent hires. [He] decided to sort of organize the research faculty within the department so that we would be able to have more of a say in how the department is run. So we meet periodically. He actually meets with the faculty advisory committee, and department advisory committee, and he's a member of that basically representing the research faculty to that group.

Dan believes that the representation of the research faculty in governance came about from the department chair and new people in the department making an effort to tap into an underutilized resource research-track faculty provide. Given that the MedU bylaws give the chair of a department discretion concerning the composition of the department advisory committee to assist with departmental affairs, as well as the composition of the advisory committee on appointments and promotions, the chair of the department plays a significant role in whether research-track faculty members have the opportunity to meaningfully participate in governance activities.

Brad participates in faculty meetings. He indicated that he is the only non-clinical faculty member who attends. Brad is fully incorporated into governance activities in the department. Brad explained, "So at first it was a bit intimidating, but then it's actually alright because they kind of treat me like an equal, and they ask my opinion, and I get a vote because I'm a full faculty member. I get a vote on everything . . ." Brad is also included in faculty dinners, dinners with invited speakers, and with faculty candidates. When describing a recent search for a new faculty member, Brad described the voting process:

it's like a democracy . . . we each get a spiel to say to the group of how we feel or why we think this person's good, or why we think this person isn't a good fit. Or you can just abstain, you don't have to say anything. . . . then it will come down to a vote. And really it's majority rules. So if a majority of people think we should opt for this person or something, then we usually do it. My vote is exactly weighted like someone else's vote. It doesn't matter that I'm not a clinician, which I think is pretty cool.

Brad's situation is unique because he was recruited to MedU with a start-up package and an interview process that resembled that of an instructional-track faculty hire. He also shares his boss's space as an equal partner, which is also unusual for a member of the research-track.

Marc, on the other hand, indicated that research meetings take place monthly while the clinical meetings take place weekly. Marc does not go to the clinical meetings because these meetings involve issues that do not relate to his responsibilities. However, Marc does go to research seminars where researchers share their knowledge and best practices for education for residents. Marc is considering getting more involved to bring basic science and clinical work together to work toward solutions to problems.

Karen regularly participates in faculty meetings, but she chooses not to participate on faculty committees. When describing governance and voting at department meetings, Karen stated, "[s]omeone will either make a suggestion and then someone has to second it, and everybody votes. But the thing is I've noticed there are other research faculty in the department, and I'm thinking of one or two in particular that I've never seen." Karen indicated that there are committees available, but she chooses not to participate on them because it would take her away from the bench. She thinks committee work is more in the purview of instructional-track faculty, since that aligns more with their role.

Dave's department provides the opportunity for all faculty members to participate in governance. Dave described recruitment efforts, "in terms of recruitment, you have one vote. You know, just raise your hand, or . . . not raise your hand and that's it." Dave noted that he does not have a say in internal funding decisions.

Charles has the opportunity to participate in faculty meetings, and he has the opportunity to vote on matters. He also feels comfortable sending agenda items for faculty meetings, and

voicing his opinion. However, Charles indicated that his primary reason for participating in faculty meetings is not really to voice his opinion, but to see how the next stage of his career might look. Nevertheless, Charles gave a specific example when he was unable to freely contribute to a vote at a department meeting.

Charles described a situation at a faculty meeting where a vote was going to be taken for a senior faculty hire. Someone asked if everyone would be voting. There were only instructional-track and research-track faculty members present, so to Charles this seemed like a jab at the research-track faculty members who were present. No one addressed this issue. A vote was taken, and the research-track faculty members voluntarily abstained from voting. Charles explained that he had no intention of voting, but was there to see how the process would work. This appears to be a situation where meaningful participation by all the faculty was not fostered and encouraged as required by the MedU bylaws.

Summary, theme 6: governance. While most assistant research scientists indicated that faculty meetings are not relevant to them, so they do not attend, a larger portion of research assistant professors chose to engage and participate in governance activities when possible. Because the governance process is managed at the department level, there are some inconsistencies in the opportunity to participate in governance among different research-track faculty members. Nevertheless, when research-track faculty members choose not to participate in department meetings they lose any possibility of meaningful participation in governance activities, which for some resulted in a feeling of lower status.

Summary

The six themes that I have covered are very similar between assistant research scientists and research assistant professors with minor differences. The first theme, role, includes the

subthemes leading as well as mentoring and teaching for both groups. However, the two groups described the two subthemes with differing prominence with leadership taking on a larger role for assistant research scientists, and mentoring and teaching being more prominent for research assistant professors. The second theme, the work itself, also varied in a couple of respects. Assistant research scientists described helping others and having flexibility more prevalently than research assistant professors who placed more emphasis on working with students and valuing the ability to be self-directing in their work. However, both groups first emphasized the love of doing research or science.

The third theme, resources, was similar for both groups as both described job security as a negative aspect of the job as well as the competition for funding with more established tenure-track faculty. Both groups also acknowledged that they have access to needed resources to do their jobs. However, assistant research scientists described compensation as a more prevalent issue than the research assistant professors did.

The fourth theme, career and promotion, includes subthemes related to PI and department support, and striving, or working toward career progression. This theme differed between assistant research scientists and research assistant professors in that assistant research scientists discussed the clarity of the promotion process while research assistant professors discussed the opportunity for promotion. The job expectations between the two groups differ, requiring research assistant professors to garner independent funding to remain in their role, and also to be considered for promotion, while assistant research scientists did not have the same expectation to acquire independent funding. Both groups of faculty engaged in striving behavior for different reasons, such as to position themselves to be more competitive to move into a tenure-track

position somewhere else, or to secure funding to continue to move their career trajectory forward.

The fifth theme, collegiality, and the sixth theme, governance, are the only two themes that have identical subthemes across both faculty groups. Both groups described collaboration as a positive aspect of their work. There was also some consistency between both groups concerning recognition and external perceptions. Neither group cited recognition as a positive element of their work, and both groups acknowledged the difficulty with external perceptions concerning their role as a research-track faculty member which made competing for grant funding more difficult, and which brought their status into question.

Assistant research scientists expressed a lower likelihood of participating in governance opportunities than research assistant professors because they did not believe that department meetings, that were often clinically focused, were relevant to them as researchers. The opportunity to participate in governance was inconsistent for research assistant professors who were interested in participating because not all departments included research-track faculty in governance activities. For those research assistant professors who wished to participate in governance and who did not have the opportunity to participate, they felt like second-class citizens.

Overall, the experience of assistant research scientists and research assistant professors is similar, but they can be distinguished due to the differing expectations at MedU for the two different tracks. Research assistant professors are expected to take on a more active role mentoring students and teaching in the context of research than assistant research scientists who are more likely to take on a leadership role in the lab while supporting the PI of the lab where they work. Consistent with their roles, research assistant professors derived more satisfaction

from working with students while assistant research scientists derived more satisfaction from helping others.

Research assistant professors were also required to obtain independent research funding to be successfully promoted while assistant research scientists did not have this requirement. Even though both faculty groups described MedU as a collegial place where they had equal access to resources to do their work just as any other faculty member, members of both groups still often strived in their work to increase their value at MedU or to make themselves competitive for potential tenure-track positions elsewhere.

CHAPTER 6

Discussion

Before considering the findings in light of the theoretical framework, I will first review the purpose of the study and the research questions. The purpose of the study was to develop an understanding of how research-track faculty working in biomedical sciences in the medical school of a research university with highest research activity experience their work. The research was guided by the following research questions:

1. How do assistant research scientists and research assistant professors in a medical school at a research university with highest research activity and also with developed policies and practices specific to this research track experience determinants of job satisfaction and dissatisfaction in their work environment?
2. How do assistant research scientists and research assistant professors in a medical school at a research university with highest research activity and also with developed policies and practices specific to this research track experience elements of organizational justice in their work environment?
3. How do assistant research scientists and research assistant professors experience their work in comparison to each other?

The first research question sought to understand how research-track faculty experience determinants of job satisfaction and dissatisfaction. The theoretical framework that informed this study incorporates six dimensions of work, which Kalleberg (1977) identified in his theory of job satisfaction including an intrinsic dimension and five extrinsic dimensions. The final revised conceptual model depicted below in Figure 2 captures the findings of this study and includes one

intrinsic dimension, the work itself, four extrinsic dimensions: 1) resources; 2) career and promotion; 3) collegiality; and 4) governance; and a separate theme, role.

Kalleberg's (1977) intrinsic dimension concerns the task itself, such as whether the work is interesting, whether one can direct their own work, and whether one can see the impact of their efforts. Both assistant research scientists and research assistant professors consistently indicated that they derived satisfaction from the intrinsic dimension of their work, which I labeled as *The Work Itself* in the conceptual model.

The extrinsic dimensions Kalleberg (1977) described in his job satisfaction theory include: convenience, financial, resource adequacy, career, and relationships. The convenience dimension includes characteristics of the job, such as convenient hours and location, and pleasant physical surroundings. The convenience dimension did not emerge as a theme that either group of research-track faculty identified as a determinant of job satisfaction. For this reason, I did not include the convenience dimension in the revised conceptual model.

Financial and resource adequacy are described as two separate extrinsic dimensions of work in Kalleberg's (1977) theory of job satisfaction. The financial dimension covers job security, compensation, and benefits while the resource adequacy dimension concerns whether the available resources are adequate to perform the job well. Because research-track faculty rely heavily on grant funding to cover their salaries and also to cover the costs of doing their research, the financial dimension and resource adequacy dimension are closely related for this group. For this reason, in the revised conceptual model I combined the two dimensions into one category called *Resources*.

An additional extrinsic dimension Kalleberg (1977) defined in his theory of job satisfaction is career. The career dimension includes whether there is opportunity for promotion,

whether promotions are handled fairly, and whether everyone has the chance to progress in their career. The career dimension did emerge as a theme for both groups of research-track faculty. I have included *Career and Promotion* in the revised model.

Relationships with co-workers is an additional dimension that Kalleberg (1977) defined. The relationships dimension as envisioned by Kalleberg (1977) concerns whether there is an opportunity to develop friendships, and whether co-workers take a personal interest in the individual. Relationships take on a broader significance in an academic career than Kalleberg's (1977) definition describes. Research-track faculty often must rely on relationships with others to successfully navigate their career. This may mean collaborating on a grant, requesting support from a department chair or director, or seeking mentoring relationships. Relationships are also meaningful when considering whether research-track faculty members feel respected or included. I have categorized the relationships dimension as *Collegiality* in the revised conceptual model.

An additional extrinsic dimension that I added to the conceptual model that is particularly relevant in academic careers is *Governance*. The opportunity to participate in governance is a factor that some research-track faculty assessed when considering their job satisfaction, which makes governance an appropriate extrinsic dimension to add to the revised conceptual model.

A theme that I added to the model which supplements Kalleberg's dimensions of work is the theme *Role*. The faculty role provides important information to define and describe the work that research-track faculty do. However, the faculty role is not an intrinsic or extrinsic dimension of the conceptual model because people do not derive satisfaction from their role, but from the actual tasks associated with the work they do. The role is more explanatory providing details

about what is expected from research-track faculty members at MedU and how they perceive and enact their own job functions.

The second research question seeks to understand how research-track faculty experience elements of organizational justice in their work. The theoretical framework includes three components of organizational justice, including distributive justice, procedural justice, and interactional justice. Perceptions of organizational justice impacted how research-track faculty experienced the extrinsic dimensions of their work. For this reason, the components of organizational justice are reflected in the revised model as an extension of the extrinsic dimensions.

Distributive justice concerns the justice of outcomes (Cropanzano, Bowen, and Gilliland, 2007). Distributive justice comes into play in the *Resources* dimension through allocation of resources and in the *Career and Promotion* dimension through the ability to move forward in one's career trajectory, which are reflected on the conceptual model.

Procedural justice concerns how outcomes are allocated, which is not related to the outcomes themselves (Cropanzano et al., 2007). Cropanzano and colleagues described a just process as a process that is applied equally to all, consistent with ethical norms (2007). Procedural justice is relevant to how resources are allocated, how promotions are awarded, and how participation in governance is established. I have included procedural justice on the revised conceptual model as relevant to the extrinsic factors, *Resources*, *Career and Promotion*, and *Governance*.

The third element of organizational justice, interactional justice, concerns how people treat each other (Cropanzano et al., 2007). Interactional justice is most relevant to the extrinsic

factors *Collegiality* and *Governance*, so I have included interactional justice on the conceptual model for both of these extrinsic dimensions.

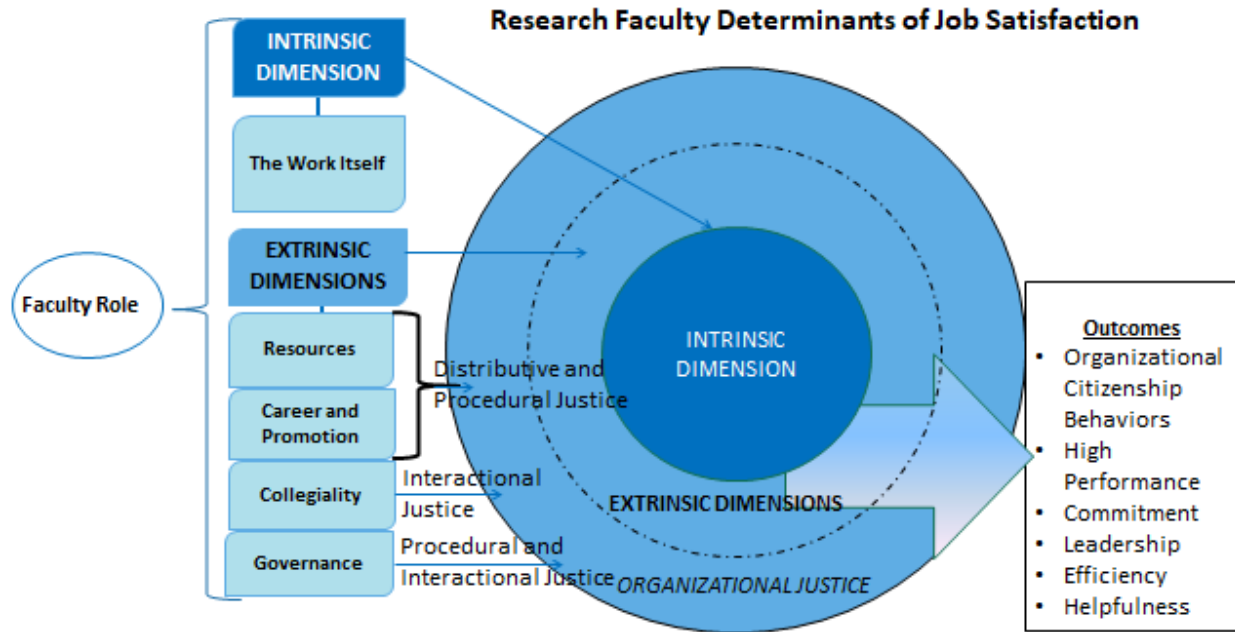


Figure 2: Revised Conceptual Model of Research Faculty Determinants of Job Satisfaction

Below I consider each of the themes that emerged in this study in light of the theoretical framework. The themes represent the job expectations and the role that research-track faculty play in their work, an intrinsic dimension, and the extrinsic dimensions that assistant research scientists and research assistant professors identified as relevant to determinants of satisfaction or dissatisfaction in their work. Within these themes, I also address elements of organizational justice that impact job satisfaction. I have included outcomes in the final conceptual framework which capture the impact that perceptions of job satisfaction and organizational justice appeared to have on the work of research-track faculty. The discussion that follows provides insights and details in response to the research questions posed in this study. The themes that follow include: role; the work itself; resources; career, collegiality, and governance.

Theme 1: Role

The research-track faculty role provides details about the work of research-track faculty at MedU including role expectations articulated in the faculty handbook and the role that research-track faculty actually play. The subthemes included under the theme *Role* include leading and mentoring and teaching, with leading having a more prominent role for assistant research scientists and mentoring and teaching having a more prominent role for research assistant professors.

The roles that assistant research scientists and research assistant professors described are pretty consistent with the expectations of their positions detailed in the MedU faculty handbook. However, assistant research scientists described going above and beyond the requirements in the handbook by taking on leadership roles and mentoring others in the lab, as well as by engaging in teaching activities for professional development reasons, to help the department, or because they enjoy teaching.

Going above and beyond expected responsibilities can be considered to be engaging in Organizational Citizenship Behaviors (OCBs), which Moorman and colleagues (1993) described as discretionary behaviors that are not formally recognized by the reward system in the organization, but that are helpful to the organization's operations. By taking on leadership roles in the lab and by mentoring others, assistant research scientists freed up the lab principal investigator or director to attend to other responsibilities. The lab principal investigator or lab director is most often an instructional-track faculty member, on the tenure-track at MedU, who also has teaching and service responsibilities in addition to research. Freeing up time for the principal investigator or lab director is also beneficial to MedU's operations which increases efficiency.

No assistant research scientists expressed concern about their role or added activities, but instead described having the opportunity to engage in activities that they wished to pursue, such as teaching. For example, Jay was able to pursue teaching opportunities to fulfill a personal interest, and Trace was able to pursue teaching opportunities to fill a gap he perceived in his CV. Graham also acknowledged that he could pursue teaching if he wished to do so, but it would take some effort on his part. Even though teaching does not count toward promotion for assistant research scientists, is not a job responsibility, and MedU does not provide rewards to this group for teaching, many still chose to do it.

Research assistant professors are expected to engage in teaching activities in support of the institution's research mission, however, this does not necessarily include teaching in the classroom. Several research assistant professors engaged in teaching in support of the research mission by running journal clubs for students. Others engaged in teaching because they enjoyed this activity, or because they wished to help the department. Taking on teaching responsibilities relieved the department chair from finding another faculty member to take on this role, and this also protected the time of other faculty members who may have been enlisted to complete these activities.

It should be noted that Moorman and colleagues (1993) posited that perceptions of fairness are important to the development of faith and trust, which are needed for people to engage in OCBs. When discussing their roles, neither group of research-track faculty expressed concerns about taking on additional responsibilities, but were instead ready and willing to help. Additional activities were pursued by research-track faculty who had a desire to do more, which was unrelated to institutional expectations. Another reason for taking on additional

responsibilities was for the enjoyment of the work, as expressed in the next theme, the work itself.

Theme 2: The Work Itself

The subthemes included in this theme for both research-track faculty groups are the *love of research* and *autonomy*. Assistant research scientists described helping others as a satisfying aspect of their work while research assistant professors described deriving satisfaction from working with students. To cover these differences, I included the subtheme *helping* for assistant research scientists and *working with students* for research assistant professors.

Both assistant research scientists and research assistant professors consistently indicated that they enjoy their work, and they derive satisfaction from doing research and science. This theme aligns with Kalleberg's (1977) intrinsic dimension, which is associated with the task itself. The work itself includes such factors such as whether the work is interesting, whether the individual is able to direct their own work, and whether the individual can see the results of their work (Kalleberg, 1977).

All five assistant research scientists described research as exciting or interesting, which I have covered in the subtheme, the *love of research*. They described enjoying doing research, and they valued the opportunity to engage in this activity at work. Being helpful, a subtheme for this group, was also a source of satisfaction for four of the six assistant research scientists. They expressed satisfaction with the opportunity to help patients by facilitating new treatments in the clinic, by doing work that enables others to complete their own research activities, and by contributing to the needs of the department.

An additional characteristic of their work that some assistant research scientists valued is autonomy, allowing them to direct their own work, which also aligns with Kalleberg's (1977)

conception of the intrinsic dimension, the work itself. Directing their own work also means deciding whether or not to engage in some activities, such as teaching. Some assistant research scientists expressed that they valued being able to complete their work within their own time schedule. No one is checking to see when or how they are doing their work, but they have the flexibility to complete their work on their own time schedule giving them flexibility and a desirable work-life balance.

Research assistant professors also overwhelmingly expressed satisfaction with the work itself, describing several aspects of the work that they valued, such as using their hands to do the work and having the freedom to think and to express their creativity. They also derived satisfaction from working with students and through the opportunity to direct their own work.

A subtheme that applied to research assistant professors but not to assistant research scientists, which is consistent with Kalleberg's (1977) intrinsic dimension and the ability to see the results of one's work, was working with students. Through working with students, five out of six research assistant professors expressed satisfaction with being able to see their impact. It was particularly satisfying to several research assistant professors to see students learning through their mentoring or teaching, or to see students reaching their goals in part due to these research assistant professors' personal efforts.

A number of research-track faculty members described making decisions so that they could pursue research above other career opportunities. Jay decided to pursue a career in research instead of working in industry where he would have been more highly compensated. Jason changed his career goals from being a community college math professor to doing research after experiencing research in a lab during his postdoctoral studies. Lisa, Eric, Marc, and Dave could have each continued in practice as medical doctors. However, each of them made the

decision to pursue research careers, though Lisa with some regret due to the insecurity of her position now and in the future.

Given the tenuous nature of employment for research-track faculty who often struggle with a lack of job security, reduced compensation, and ongoing stress and pressure to obtain funding to support their careers and future success, it is not surprising that the intrinsic dimension plays a significant role in how this faculty group derives satisfaction from their work. If not for the work itself, it is possible that members of this group may have made different career choices. However, there is an alternative theory that could also potentially explain why some research-track faculty members continue in their chosen career despite its challenges.

Research-track faculty members have undergone many years of education and training to prepare them for a career in academia. Such education and training may have precipitated a commitment to an academic career, no matter the cost. Becker (1960) described a scenario where once one “claimed to be a certain kind of person, they find it necessary to act, so far as possible, in an appropriate way” (pp. 37-38). When a person presents oneself as a certain person, in this situation as a member of the faculty, they may feel the need to continue this image to be congruent with how they have represented themselves to others, and perhaps to also align with how they perceive themselves. People may make commitments unknowingly, which constrain their behavior preventing them from making different choices (Becker, 1960). Although the research-track faculty members who participated in this study indicated that they are generally satisfied with their work, their commitment to being a researcher in academia could be so strong that they would be willing to overlook negative aspects of the job to continue the course of their career.

While research-track faculty members experience much satisfaction from the nature of their work, the financial aspects of their job including job security and competition for funding were aspects that were less satisfying. Next, I discuss in detail theme three, resources.

Theme 3: Resources

Job security, access to resources, and seeking funding and competition are all subthemes under the *resources* theme for both research-track faculty groups. Compensation emerged as a subtheme for assistant research scientists only. The financial work dimension described by Kalleberg (1977) includes compensation, benefits, and job security. Kalleberg (1977) identified an additional work dimension, resource adequacy, that is also captured in the resources theme under the access to resources subtheme. Resource adequacy includes whether adequate resources are available to do the job well, and also whether the “help, equipment, authority and information required for job performance are adequate, whether co-workers are competent and helpful, and whether the supervision is conducive to task completion” (Kalleberg, 1977, p. 128).

The research-track faculty who participated in this study overwhelmingly identified the lack of job security as a negative aspect of their jobs. After completing so much education and training, it was discouraging to some that they would be in such a tenuous situation. Research-track faculty members rely on external funding, often from the National Institutes of Health, to support their salary. However, because funding has become increasingly difficult to obtain, even for established instructional-track faculty with tenure, the future is particularly uncertain.

While the difficulties associated with trying to obtain research funding contribute to the insecurity that research-track faculty members experience, distributive justice issues may exacerbate the issue further. Distributive justice has been depicted as “the allocations or outcomes that some get and others do not” (Cropanzano, Bowen, and Gilliland, 2007, p. 37).

Although research-track faculty members at MedU have the opportunity to submit grant proposals to the same extent as instructional-track faculty, they must do so with significantly less resources. Instructional-track faculty members typically receive a start-up package so that they can build their lab and amass preliminary data for manuscripts and future grant applications. They are also typically assigned their own lab space where they have the freedom to develop their own research program and research independence.

On the other hand, research-track faculty members most often share space with an independent investigator, often drawing salary from that investigator's grants making it very difficult to develop separate data for their own research program. Research-track faculty members receive very little if any funds from the department in support of their research and professional development. Rather, department funds that are paid toward research-track faculty salary are more often paid to support teaching activities that benefit the department. Without committed salary support, independent space, and lab resources, research-track faculty are at a significant disadvantage when trying to compete for research funding.

Research-track faculty members' struggles are compounded by the tight funding climate. They understood how difficult it is to obtain funding for all faculty. They often expressed losing hope about the probability of obtaining independent funding when more senior faculty with tenure were unsuccessful themselves. An additional obstacle that research-track faculty members face is that grant reviewers often question their status and independence when reviewing their grant applications making acquiring funding even more difficult. Despite these challenges, research-track faculty consistently expressed feeling supported by colleagues in their work at MedU, a topic that I discuss in the *Collegiality* theme.

Even though the participants in this study did not indicate directly that they did not have adequate resources to perform their work well as envisioned by Kalleberg (1977), this is likely the case when considering grant-seeking activities, a key requirement of a research-track faculty members' job expectations. Some participants described seeking grant funding as a "catch-22" experience. They need to be independent to obtain grant funding, but they need to get grant funding to become independent. This can become a frustrating cycle that is very difficult for a research-track faculty member to break out of. However, once a faculty member is successful in garnering funding, whether this be an instructional-track or a research-track faculty member, both have equal access to research core facilities and other resources at MedU to do their research.

Compensation, one of Kalleberg's (1977) financial work values, was also a common negative factor about the job that assistant research scientists described. Nevertheless, a couple of assistant research scientists justified the lower salary by indicating that working in academia rather than working in industry brought lower compensation, and also stating that lower compensation is consistent with having less responsibilities than instructional-track faculty members. However, one assistant research scientist described their compensation as inadequate in comparison to instructional-track faculty members, so not all members of this group perceived their compensation the same way.

An equity allocation rule in distributive justice described by Cropanzano and colleagues (2007) is that each individual should receive allocations according to their contributions. If a person is making equal contributions when compared to another, equity would require that both individuals receive the same compensation. However, Cropanzano and colleagues (2007) also provided that an individual who is compensated less than others may still be satisfied as long as

they believe that they are contributing less than other more highly compensated people, which may be the case for some research assistant professors. While compensation was mentioned as an issue for five out of six assistant research scientists, four out of the six did not indicate that they were being compensated unfairly, which indicates that they were not experiencing distributive justice issues.

MedU has extensive resources for research that all faculty have the opportunity to access as needed to do their work. However, the provision of resources by MedU to research-track faculty to enable them to successfully compete for research funding is limited. The consensus among research-track faculty is that they have the opportunity to compete for funding, however, they also sense that their ability to be competitive is constrained due to their status and lack of resources to build a research program. The cycle of not being able to establish independence to secure grant funding contributes to a dilemma for research-track faculty. Both research-track faculty groups experience an ongoing lack of job security in their position, and for research assistant professors in particular who are required to obtain independent funding, an inability to move forward in their career.

Theme 4: Career and Promotion

The *Career and Promotion* theme covers the promotion process and the opportunity to build a career and to be promoted. The subthemes that were covered under this theme include the clarity of the promotion process for assistant research scientists, and the opportunity to achieve promotion for research assistant professors, and for both groups, job expectations, department/principal investigator support, and striving.

Kalleberg's (1977) career value covers prospects for promotion, including whether the opportunity to be promoted is good, whether the process is fair, and whether the employer

encourages promotion of everyone. MedU does expect research-track faculty to progress in their careers. There is a requirement in the MedU faculty handbook that research-track faculty progress along their career track within six years. If a faculty member does not progress satisfactorily on their current path, then they can be shifted to another track that more closely aligns with their progress and productivity.

The opportunity to be promoted is present for everyone. However, there are some constraints for both research-faculty tracks. Four of six assistant research scientists indicated that the promotion process was not clear. A particularly interesting point that one assistant research scientist made is that others, particularly administrators, may perceive research-track faculty positions as “layover” positions, causing them to not be familiar with promotion guidelines. Members of both groups of research-track faculty consulted with others in the department about promotion, whether this be a department chair or the principal investigator in the lab for whom they worked. When individuals who are a usual resource for research-track faculty are not familiar with the guidelines, this can make it difficult for faculty members who are trying to achieve promotion to understand what is needed to be promoted successfully. However, everyone who had the three-year review meeting with the assistant dean from the medical school found it helpful to discuss promotion and their individual readiness at that point in time.

Overall, no participants in this study described the promotion process as unfair. Assistant research scientists generally believed that their job expectations toward receiving promotion were clear. However, research assistant professors were less clear about what was expected of them. Some research assistant professors turned to their bosses for information about what was required of them for promotion, and others reviewed information on-line. Even though the

promotion guidelines were not clear to everyone, participants described the opportunity to pursue promotion as freely available to all.

MedU encourages promotion, at least in theory, but there are some inconsistencies in practice. The MedU faculty handbook indicates that there is a mandatory three-year review meeting with an administrator in the medical school for assistant research scientists. This meeting is also offered and encouraged for research assistant professors. However, not all research-track faculty members who participated in this study had the opportunity to participate in such a meeting.

Although efforts by administrators at MedU to offer the third-year review to all research-track faculty positively impacted how some research-track faculty perceived their role, the inconsistency of these meetings did not appear to cause perceptions of injustice. Procedural justice includes consistency, such as whether all employees are treated the same (Cropanzano et al. 2007). However, no participants expressed concerns about disparate treatment concerning promotion procedures compared to other research-track faculty members, or in comparison to instructional-track faculty members. This could potentially be because research-track faculty often work in different labs and departments. If they do not have the opportunity to speak with each other about their experience, then they will be unaware of inconsistencies in how procedures are enacted.

Kalleberg's (1977) career value also considers whether individuals are encouraged to be promoted. If MedU does not consistently provide third-year review meetings to all research-track faculty members, this could be perceived as less encouraging of promotion by those individuals who are excluded from having a meeting, particularly if they wish to participate. However, a couple of assistant research scientists and a majority of the research assistant professors

described receiving support from a principal investigator, a director, or a department chair, which provided another source of encouragement for career progression.

Institutional support during the promotion process can also be considered encouraging. Several assistant research scientists described departmental support that they received with the administrative tasks associated with submitting a promotion packet as helpful. By providing resources to all faculty members to assist with preparation of promotion packets, MedU is acting in a procedurally just manner while providing the opportunity for everyone to be promoted. An indication of procedural justice is a lack of bias, where no person or group is set apart for ill-treatment (Cropanzano et al., 2007). No research-track faculty gave any indication that they felt like they were treated differently during the promotion process at MedU than any other faculty members.

Even though the opportunity to be promoted is available at MedU for research-track faculty members, the requirement that a research assistant professor have independent external funding to be promoted to a research associate professor is increasingly difficult to meet. For some research assistant professors, this is the one factor that is keeping them from being promoted. MedU's funding expectations are no different for research assistant professors than they are for instructional-track faculty members who typically have the benefit of more resources with which to develop an independent research program.

Research-track faculty are highly motivated and committed to making their careers work. For assistant research scientists, this means striving to move forward in their career by going above and beyond their job responsibilities, such as by seeking independent funding and engaging in teaching activities, which will make them more competitive for a tenure-track position elsewhere.

The research-track faculty members who participated in this study did not indicate that they perceived that either the opportunity to be promoted or the promotion process itself was unfair. Rather, this group of faculty indicated that they had the opportunity to be promoted, and that their success was up to them, however difficult it might be. They actively pursued information from various sources to help clarify the promotion process and the expectations of their position, and they felt supported by others in their pursuit of career progression with limited exception.

It should be noted that when employees feel that a process is just, they are more likely to be loyal toward the organization including behaving in the organization's best interests (Cropanzano et al., 2007). Research-track faculty members' perceptions of a fair promotion environment at MedU likely contribute to their willingness to stay the course as research-track faculty members while also striving to maximize their career potential, which is highly beneficial to MedU.

Theme 5: Collegiality

The *Collegiality* theme includes the subthemes collaboration, recognition, and external perceptions for both faculty groups. According to Kalleberg (1977), the relationships dimension, which is called collegiality for purposes of this study, covers an employee's desire to have social needs met at work. This includes the opportunity to make friendships, to work with people who are helpful and friendly, and who take a personal interest in the individual (Kalleberg, 1977).

Both assistant research scientists and research assistant professors indicated that the environment is collaborative at MedU. They believed that they had the opportunity to develop meaningful collaborations as long as they were willing to make the effort due to MedU's size

and complexity. Once they developed collaborations with others, participants felt that they were treated no differently than any other faculty member at MedU.

However, participants did not describe developing friendships as Kalleberg (1977) described. By the same token, research-track faculty did not indicate that they had an unfulfilled desire to establish friendships at work. Their overall perception of their work environment concerning relationships was that they had the opportunity to collaborate, and that they felt respected in those relationships.

Interactional justice simply refers to how one person treats another (Cropanzano et al., 2007). However, there are two components of interactional justice including informational justice, which is whether a person is honest and adequately justifies negative results, and interpersonal justice, whether a person is treated with dignity and respect (Cropanzano, et al., 2007). I address each component of interactional justice separately.

The research-track faculty who participated in this study did not describe informational justice issues. No one indicated that they felt that they received dishonest information, or an inadequate justification of negative results. The participants in the study attributed negative results, such as not being able to acquire research funding needed to achieve promotion, as related to the tight funding climate, and also related to their status outside of MedU.

The interpersonal aspect of interactional justice concerns whether a person is treated with dignity and respect (Cropanzano, 2007). Other than with regards to governance which I address below under theme 6, both research-track faculty groups described feeling respected. Others at MedU, such as a department chair, principal investigator in the lab, or the assistant dean from the medical school, listened to the preferences and goals of research-track faculty concerning their work and made efforts to support them in these efforts. Sometimes support meant facilitating

teaching experience for those who were interested in this activity, listening to research ideas and encouraging their development, or discussing and supporting a switch of research-tracks from a professor to a scientist track. Research-track faculty felt listened to, which was a sign of the presence of interpersonal justice.

Recognition also had an impact on whether research-track faculty members felt like they were being treated with respect. Assistant research scientists indicated that they felt recognized at MedU by being promoted, when a grant was received, and when they were nominated for an award. Research assistant professors, on the other hand, described feeling less recognized at MedU than assistant research scientists. This can be due to research assistant professors' perception that the bar for recognition was so high, that it could be difficult to attain. For example, to be recognized at MedU, a major research grant would need to be funded, a publication in a very prestigious journal would need to be accepted, or election to a society would need to occur. It is very difficult for any faculty members, and especially so for research assistant professors, to meet this bar. When research assistant professors are not recognized for their contributions because their contributions are not considered to be good enough, this could work to reduce the level of respect they experience.

Five of seven research assistant professors described an awareness of the difference between their status and the status of instructional-track faculty, the track eligible for tenure at MedU, feeling that research assistant professors were less highly regarded, second-class, or "lower on the totem pole." This was partially attributed to the lack of opportunity to meaningfully participate in governance, described below in theme 6, and may also be related to external perceptions of their role, also described below. Interestingly, assistant research scientists did not describe having a perception of lower status. This could potentially be related to the fact

that assistant research scientists have different job expectations than research assistant professors. Research assistant professors have the same scholarly expectations at MedU as instructional-track faculty, including garnering external research funding and having first-author publications, while assistant research scientists are not required to obtain independent funding.

Even though Kalleberg (1977) does not describe external interactions as part of the relationships dimension in his theory of job satisfaction, external relationships are relevant in the context of faculty careers and are an appropriate component of this dimension in the conceptual model. Unlike a typical employment situation where one's career occurs essentially entirely within an organization, faculty careers are inextricably linked to external interactions as well through collaborations with external colleagues, and through participation in conferences and scientific organizations.

Both assistant research scientists and research assistant professors indicated that they do not feel recognized outside of MedU. There is a stigma or lower status associated with being a research-track faculty member, which research-track faculty experienced through interactions with others outside of MedU. Three out of six assistant research scientists indicated that grant reviewers questioned their role or title because it is different than a more typical appointment on the tenure track. Three of seven research assistant professors also identified external perceptions of their role as problematic. A stigma is associated with being a research-track faculty member, and there is a perception that those on the tenure track are better or more qualified than those who are not. These external interactions increase research-track faculty perceptions of inadequacy that are not typically experienced through interactions within MedU alone. External perceptions decreased the overall feeling of respect that research-track faculty members felt in their work.

Research-track faculty members described MedU as a collaborative environment where they are able to build collaborations with others. Members of the research track overwhelmingly indicated that they felt respected by others at MedU. However, for several research assistant professors, the absence of the opportunity to meaningfully participate in governance made them feel less respected. Research assistant professors also expressed feeling less recognized at MedU than did assistant research scientists. This could be due to the fact that research assistant professors, who are required to obtain independent funding, had a higher bar to reach to receive recognition than assistant research scientists. Nevertheless, the overall consensus was that the environment at MedU was collaborative and respectful. There was also consensus from both research-track faculty groups that they felt less respected by colleagues external to MedU who did not understand their role.

Theme 6: Governance

The *Governance* theme includes one subtheme, participation. Governance is not a dimension that Kalleberg (1977) defined in his theory of job satisfaction. However, governance is an important part of being a faculty member. Faculty often engage in governance activities to participate in the decision-making processes of the institution (Finkelstein, Conley, and Schuster, 2016). For this reason, I have included governance as an extrinsic dimension in the conceptual framework. When faculty members do not have the opportunity to meaningfully participate in governance, this can impact how they perceive their role as well as their job satisfaction, as was the case with some of the research assistant professors who participated in this study.

For the most part, assistant research scientists indicated that they chose not to participate in governance activities at MedU because they believed that these activities were not relevant to them. Several assistant research scientists stated that department meetings did not pertain to

research, but were more relevant to clinical activities. Assistant research scientists did not assert that they felt that their lack of participation had any relationship to their status as a faculty member. Therefore, lack of participation in governance did not appear to impact their satisfaction.

On the other hand, participating in governance was more meaningful to research assistant professors than it was to assistant research scientists. Five of the seven research assistant professors described wishing to participate or actually participating in governance activities to some extent. Two research assistant professors who were excluded from participating in governance activities described feeling like second-class citizens, or feeling less respected when they did not have an opportunity to participate. Even though another research assistant professor described having the opportunity to vote on matters in the department, she still felt that research-track faculty members had lower status than instructional-track faculty members due to the lack of committee involvement. When the opportunity to participate in governance was limited, this impacted how research assistant professors felt about their status, which negatively impacted perceptions of job satisfaction.

Because the bylaws at MedU delegate responsibility for governance to the departments, involvement in governance activities among research assistant professors varied. Participants recruited for this study came from seven different departments. The bylaws also provide for the composition of the Executive Committee, a committee consisting of nine members of the medical school faculty, which has delegated authority to act on behalf of the faculty. The Executive Committee is comprised of nine members of the faculty. Of the nine members, one slot is designated for a member of the research-track faculty at the associate or full scientist or professor level. Because all of the participants in this study were at the assistant level, none of

them had the opportunity to participate as a member of the Executive Committee. It should be noted that all participating faculty tracks, such as the instructional track and the clinical track, have the same requirements of ascension in rank prior to becoming eligible to participate on the Executive Committee. It was unclear whether the participants in the study were aware of the requirements to participate on the Executive Committee.

Procedural justice requires that all employees be treated the same, that no individuals be singled out for ill-treatment, and that there is representation of all concerned in a decision-making process (Cropanzano et al., 2007). When departments exclude research-track faculty from participating in governance activities by not allowing them to vote, these faculty members are more likely to believe that the decision-making process is not just. Cropanzano and colleagues (2007) posited that when a process is perceived as just, employees are more loyal and more willing to behave in the best interests of the organization, and people are also more likely to be supportive of a decision. Although the research assistant professors who expressed an interest in participating in governance who did not have this opportunity did not indicate that they were less committed or less loyal to the organization, they did indicate that they felt less valued, which negatively affected their job satisfaction. The several research assistant professors who had the opportunity to participate in governance did not describe perceptions of second-class status deriving from governance activities.

Constraints on participation in governance can also have implications for interactional justice. Informational justice involves sharing information and explanations with others (Cropanzano et al., 2007). If a department determines that research-track faculty will not be eligible to vote on a specific matter, an interactionally just way to treat those faculty members with dignity and respect would be to reach out to them in advance individually to explain why

they would not be eligible to participate in the voting process. By not clearly defining the boundaries concerning who may participate in voting and who may not, the department is not engaging in informationally just behavior. As one research assistant professor described, an awkward situation developed when another faculty member asked if all faculty would be voting on an issue. The research-track faculty members who were present abstained from voting without understanding whether they should be excluded from voting, and if so, why this was the case. Excluding research-track faculty members from participating without explanation resulted in a feeling of second-class status and reduced dignity and respect.

The opportunity to participate in governance activities was not an important factor for assistant research scientists when considering their job satisfaction. However, this factor was important for research assistant professors who were more likely to participate in governance activities. Exclusion from participation in governance activities increased feelings of second-class status for research assistant professors, which diminished their perceptions of job satisfaction. There was not evidence of interactionally just practices, such as informational justice, that could work to mitigate the negative perceptions associated with exclusion from governance activities for research assistant professors.

Implications for Policy and Practice

In light of the changing environment in higher education that includes a growing bifurcated faculty with less tenure-eligible positions available to aspiring academics and a constricting funding climate, the findings and implications of this study for policy and practice are particularly timely. Faculty appointments look significantly different than in years past when a tenure-track faculty position was the most common faculty appointment. The ability to establish a faculty career has also been compromised as members of the faculty work to establish

and maintain a career in a shifting environment where the need for research is evident, but the resources to support it are elusive.

Although the research site for this study was a highly-resourced medical school at a research institution with highest research activity, numerous recommendations for policy and practice do not require extensive resources for implementation. Institutions of higher education can take a gradual approach to implement changes to policy and practice that will support a variety of faculty career opportunities in light of current conditions.

The findings in this study provide important information that will be useful for policy and practice for research institutions that wish to develop career opportunities for biomedical researchers in light of factors that contribute to their job satisfaction. Development of such career opportunities is consistent with Recommendation 5.3 in the recent report published by the National Academies of Sciences that recommended that research institutions “experiment with providing career tracks with clearly defined review and promotion processes . . .” (Daniels, Beninson, and National Academies of Sciences, p. 74, 2018).

In light of the shifting structure of academic appointments to include more non-tenure eligible appointments, Austin and Trice advocated for shared responsibility between individual faculty members and the institutions that employ them to mutually support each other (2016). Commitment between research-track faculty members and the institutions where they work should be reciprocal as advocated by Austin and Trice (2016). A reciprocal relationship encompasses benefits and responsibilities that are acquired by both parties. As envisioned by Austin and Trice, the mutual commitment from a faculty member includes the “responsibility to support their institutions’ missions in service to society through their creativity, intellectual contributions, good work, and participation in institutional governance” (p. 62, 2016). The

commitment on behalf of the institution is to “provide respect, protections for academic freedom and autonomy, opportunities for collegiality, flexibility, and job security for the defined time period of the faculty member’s employment contract” (Austin and Trice, p. 62, 2016).

A further shift in the research environment is the increasing reliance on teamwork (Fortunato, Bergstrom, Borner, Evans, Helbing, Milojevic, . . . Barabasi, 2018). Shifting away from principal investigator-driven individual research allows the involvement of teams of people where multiple scientists can be supported to work on a research problem. Using research teams may facilitate successful careers for research-track faculty members.

Below, I provide implications for policy and practice in the following areas: 1) research-track roles; 2) collegiality; 3) resources; 4) promotion processes; and 5) governance.

Research-Track Roles. There is value in giving research-track faculty the flexibility to develop their role outside the bounds of the required expectations of their position as defined by the institution. This flexibility gives research-track faculty agency to pursue their own careers based upon their individual goals and interests. The research-track faculty who participated in this study often engaged in activities above and beyond what was required by their defined job role. Research-track faculty were intrinsically motivated by the work that they did. They also valued autonomy that allowed them to direct their own work. When research-track faculty were engaged in work that they enjoyed doing, they were motivated to be productive and effective in their work.

Having two tracks available within the research-track at MedU with different job expectations provided additional flexibility for research-track faculty. Some research-track faculty did not have professional aspirations to obtain a tenure-track position or to become an independent scientist. For these faculty members, a position as a research scientist that did not

require independent funding was appropriate. For those who aspired to obtain a tenure-track faculty position or who wished to direct an independent research program, the research professor role, which required independent funding, aligned more closely with those goals. There was also flexibility to move between these two research tracks depending on the level of productivity achieved.

When developing career tracks for biomedical researchers, having tracks that align with the researcher's career goals, and that also provide flexibility to pursue those goals in different ways, ensures that researchers have agency to pursue their careers. When research-track faculty are able to do the work they enjoy with flexibility and autonomy to pursue their interests, this contributes positively to their job satisfaction, productivity, and commitment to their work.

Collegiality. The participants in this study perceived MedU as a very collegial and collaborative environment, which contributed positively to their job satisfaction. They had the opportunity to collaborate with others, and frequently described having mentors who were supportive of their success. The research site of this study also identified in its bylaws the expectation that all members of the faculty provide mentorship to faculty colleagues and a strong example of collegiality in the workplace. Collegiality appeared to be part of the institutional culture that included and benefited research-track faculty. Collegiality was also honored in the way that different faculty tracks were portrayed in institutional documents.

The research-track has been established at MedU for decades, and is incorporated into the institution's bylaws and faculty handbook as one of three faculty tracks at the institution, which include a clinical track, a research track, and an instructional track. Of the three tracks, the instructional track is the only track that includes eligibility for tenure. However, all three tracks are presented as equal. The Executive Faculty is comprised of faculty members from all three

tracks, and all members have the ability to vote on institutional matters which are decided by majority vote.

When developing a research-faculty track, institutions should incorporate this track into the current structure of faculty appointments rather than simply defining a new track as an added separate track. All faculty tracks should be represented throughout all institutional documents. By incorporating a research-faculty track into the current structure, the added track is not presented as less than other existing tracks. To maximize respect, it is also advisable to define a track by what it is rather than by what it is not. For this reason, when defining faculty tracks, a reference to tenure should only be included in the definition of the track that is actually tenure-eligible.

Institutions can also play an important role in fostering collegiality by informing and educating all faculty members about changing academic careers and about the contributions that all faculty members make to the institutional mission. Current tenured faculty, who often started their careers in an environment where a larger percentage of people with Ph.D.s in the biomedical sciences pursuing a tenure-track faculty position were able to find one, should be educated about how this percentage has declined significantly. Being aware of this change in the availability of tenure-eligible positions will help current tenured faculty members understand that a faculty member who was not able to secure a tenure-track position is still a highly qualified member of the academy.

Existing tenured faculty members are also major participants on grant review panels. Faculty members who serve on grant review panels often do not understand the difficulties associated with finding a tenure-track position in the current climate, as well as the role that research-track faculty play in the research enterprise. It is common for grant reviewers, who are

typically tenured faculty members, to question a research-track faculty member's qualifications and independence based on their job title when reviewing grant applications.

An institution can facilitate a culture of collegiality among various faculty tracks by expecting collegial behavior from all members of the faculty, including a willingness to mentor others, and by presenting alternative faculty tracks as equal to more traditional tenure-eligible tracks in institutional documents. Collegiality can be further facilitated by educating faculty about changes in faculty careers and about the contributions that various faculty make to the institution and to the research enterprise.

Resources. Research-track faculty at MedU experienced significant job insecurity and a lack of resources needed to effectively compete for external funding. Most research-track faculty received little to no salary support from the department at the institution. Instead, research-track faculty received their salary by committing time working on the funded research grants of others. The lack of resources pertaining to salary is problematic and can result in potential violations of federal cost principles on federal grants, limited protected time to establish an independent research program, and a lack of job security.

When research-track faculty do not receive salary support from the institution, they are required to obtain all of their salary by working on funded grants. However, federal cost principles require that all time committed to working on a grant be spent engaged in activities toward the aims of that specific grant. This means that research-track faculty who do not receive salary support from the institution do not have protected time to write grant applications or to engage in professional development activities. For research-track faculty members who are expected to obtain independent funding, the lack of salary support puts them at a significant

disadvantage when trying to establish independence. A lack of job security due to the lack of committed salary support also significantly detracts from job satisfaction.

At a minimum, institutions that develop career tracks for biomedical researchers should include salary support to ensure that research-track faculty members have the time available to write grant applications, to participate in professional development activities that support their research goals, and to participate in governance activities. By not providing salary support to research-track faculty members who are expected to submit grant applications, there is a compliance risk that research-track faculty members will engage in grant writing activities even though they are exclusively being paid to conduct research on a funded project. Considering that the federal government may extrapolate unallowable costs charged to a federal grant across an institution's entire research portfolio, the costs of noncompliance can be significant.

The lack of job security was a major source of stress that took away from the job satisfaction of research-track faculty. To address the lack of job security, institutions should provide short-term contracts for research-track faculty. There was a perception, and likely a reality, among many of the participants in this study that if external funding became unavailable, they would be immediately out of a job. Short-term contracts with a minimum base of salary support would increase job security and status, alleviate the perceptions that research-track faculty positions are temporary, and potentially increase commitment to the organization as well.

For institutions that wish to develop a research-track faculty position that requires the faculty member to obtain independent funding, a reciprocal commitment to support such a position must include in addition to salary support, space and discretionary research funds. Research-track faculty members who have responsibility to acquire independent funding must have dedicated time, space, and resources to develop preliminary data for an independent

research program. Without preliminary data, it is not possible to acquire independent funding. It is unrealistic to expect that research-track faculty members will be able to compete effectively for independent funding without basic resources that are needed to be successful.

For an institution to engage with research-track faculty members in a reciprocal relationship of commitment and support, the institution should provide short-term contracts and salary support to mitigate job security concerns and to minimize compliance risk. For those research-track faculty members who are expected to conduct independent research and acquire independent research funding, the institution should also provide resources including space and discretionary research funds to support the faculty member's development of an independent research program. In the absence of providing these resources, the likelihood of a research-track faculty member developing an independent research program at the beginning of their career is low.

Promotion Processes. The research site of this study had established promotion criteria for all faculty, including research-track faculty members. MedU had information readily available about the promotion process and requirements for all faculty tracks in the faculty handbook and available on the institution's website. MedU also designated an administrator to conduct third-year review meetings with research-track faculty to discuss their career progression and promotion potential. However, these meetings were not offered on a timely basis to all research-track faculty who desired to participate in a meeting. For those who did not receive a meeting, they felt less visible and less valued. On the other hand, those who did receive a meeting felt validated. They felt that having a meeting was an indication of institutional awareness of their presence, and they weren't lost.

According to the medical school bylaws at MedU, the responsibility for career development of faculty members resides with the department chair. The department chair, or the chair's designee, is also responsible for conducting a written, formal, annual performance review for all faculty members. Among the participants in this study, some received a performance evaluation from the department chair while others received an evaluation from the principal investigator of the lab where they worked. For those who received an evaluation from a department chair, they felt more connected to the department and felt that they were better able to build a relationship with the department chair.

Institutions that wish to develop a research-track for faculty should have clearly defined promotion requirements and procedures. When MedU committed resources to the promotion process by designating an administrator to facilitate career progression for research-track faculty, members of this group felt more included and less invisible. Designating an administrator as a liaison to check in with research-track faculty on a regular basis concerning the promotion process is an effective way to help members of a research-track faculty group to feel visible and included in institutional life while providing support for career progression. However, these meetings should take place consistently and on a timely basis for all research-track faculty so that the members of this group continue to feel valued.

It is also beneficial for department chairs to conduct annual evaluations with all faculty members rather than to use a designee for some faculty members and not for others. When department chairs conduct annual evaluations with research-track faculty, members of that faculty group feel more included and more incorporated into the department.

Along with developing clear promotion requirements and processes, institutions that wish to develop an inclusive faculty research track should provide support to research-track faculty to

facilitate career progression. Interaction with a designated administrator and with a department chair rather than a chair designee should result in an increased sense of belonging in the institution.

Governance. The bylaws at MedU require the department to be organized in such a way as to assure the meaningful participation of all members of the faculty in departmental governance. Each department also has an advisory committee that assists the chair and facilitates faculty input into departmental affairs. The department chair has discretion concerning the composition and structure of the advisory committee. Because the department chair has discretion, participation of research-track faculty in governance activities varied by department. For those who did not have an interest in participating in governance because they felt that it was not relevant to them, the lack of the opportunity to participate did not impact their job satisfaction. However, for research-track faculty members who did have an interest in participating in governance activities, and who did not have this opportunity, they felt like second-class citizens.

Institutions should make an effort to make meaningful participation in governance activities available to all faculty members. By delegating the composition and structure of the departmental advisory committee to the chair, there is an opportunity for the chair to exclude some members of the faculty from participation. Therefore, it is advisable for institutions to require minimum representation from each faculty track on departmental advisory committees, and to communicate these expectations to all members of the faculty. Such a requirement would not eliminate the department chair's discretion, but would ensure inclusion of all faculty tracks on departmental advisory committees.

It was also common for research-track faculty, particularly assistant research scientists, to indicate that department meetings were not relevant to them because they were clinically focused. To make departmental governance more inclusive, departments could separate non-clinical decision-making meetings from clinical decision-making meetings so that members of the faculty may more easily identify governance opportunities that are relevant to their role in the department.

Summary. In light of the findings from this study, there are many ways that institutions of higher education can work toward making a reciprocal commitment to research-track faculty. While research-track faculty members at this highly-resourced institution indicated that they felt that they were treated well, research-track faculty members at other institutions may have a different experience. Much can be learned from the work that the research site for this study has already done to diversify career paths available for biomedical researchers, and to support them in their careers. One institution cannot do this alone. Instead, a collective effort is needed to ensure that a positive working environment is fostered for all members of the faculty.

Six of the ten suggestions I have included below do not require additional resources for implementation. Institutions of higher education can make deliberate choices now to work toward making alternative biomedical research career paths more inclusive and more sustainable, ensuring an organizationally just environment for all members of the faculty. For ease of reference, I have listed a summary of suggested practices below.

- 1) Develop alternative research faculty career tracks that offer flexible roles based on individual career aspirations and productivity
- 2) Incorporate the research-faculty track into the existing institutional structure

- 3) Inform and educate all members of the faculty about changing faculty careers and the contributions that all make to the institutional mission
- 4) Provide salary support to ensure that research-track faculty members have protected time to write grant applications and to participate in professional development and governance activities
- 5) Provide short-term contracts to increase job security
- 6) Provide space and discretionary research funds for research-track faculty with responsibilities to obtain independent research funding
- 7) Designate an administrator to oversee career progression of research-track faculty to facilitate inclusion in the institution
- 8) Require department chairs to complete annual formal written evaluations of all faculty members to foster departmental inclusion
- 9) Require that departmental advisory committees include representation from all faculty tracks to ensure the opportunity for all faculty to meaningfully participate in governance activities
- 10) Separate clinical decision-making from non-clinical decision-making to encourage participation of non-clinical faculty members

Non-Federal Funding Agencies. Non-federal funding agencies are an important source of funding for early-career stage investigators. Funding from non-federal sources often provides pilot funding or career development funding needed to generate preliminary data for larger grant proposals to the federal government. The policies and practices of non-federal funding agencies can impact what opportunities are available to research-track faculty, which can impact the trajectory of their careers.

Non-federal funding agencies such as foundations and non-profits may require that applicants for career development opportunities have a tenure-track position. There are also time limits for some opportunities between the date of application and the receipt of the faculty member's terminal degree. Given the extended time that it takes to establish an independent research career, particularly for research-track faculty members, these faculty members may become ineligible to apply for these career development opportunities. Career development opportunities often provide funding for mentored research activities that gives the recipient of such awards the opportunity to develop preliminary data toward establishing an independent research program.

Non-federal funding agencies can support research careers by eliminating the eligibility requirement that applicant faculty members have a tenure-track position. Employing institutions can provide letters of support as evidence of support for space and resources for research-track faculty to complete a proposed research project. Tenure-track status is not a pre-requisite for having institutional support to engage in sponsored research activities.

As Daniels and colleagues noted, the age of receipt of the first major NIH grant, an R01, has increased from age thirty-six in 1980 to forty-three in 2016 (2018). Given the increasing length of time it takes to establish an independent research career, funding agencies should extend the length of time applicant faculty members have to be eligible to apply for career development opportunities. Rather than restricting eligibility to the passage of time, foundations and non-profits could permit "new investigators," defined by the NIH as those investigators who have not yet successfully secured independent funding, to apply for career development opportunities. When early-career researchers are excluded from participating in opportunities to obtain funding, there is an increased likelihood that their research career will not be sustainable.

The loss of research talent from the research enterprise may jeopardize the ability of the United States to remain a global leader in scientific innovation.

Implications for Future Research

The conceptual model that I developed for this study is new. The use of organizational justice, in particular, is novel in higher education. Organizational justice concepts can make a relevant and meaningful contribution to understanding how just practices may impact how faculty members with non-traditional appointment types experience their work. Future research could examine organizational practices using an organizational justice framework in conjunction with studying the perceptions of faculty with non-traditional appointments within the organization.

Because this study was small and was limited to one institution, and to only biomedical sciences, future research would be helpful to explore the presence and experience of research-track faculty members at other research institutions that either have an established research-faculty track, or that have the presence of research-faculty at their institutions. Research could also be expanded to include a wider range of disciplines to see how discipline may impact the faculty experience. It would also be enlightening to broaden the study to include other stakeholders such as tenure-track faculty members, department chairs, and other administrators to understand how these groups perceive and interact with research-track faculty members.

This study, which only included early-career stage research-track faculty, could be expanded to include more established research-track faculty at the associate and full professor levels to determine whether more senior research-track faculty members have similar work experiences to earlier stage research-track faculty. Such research could provide information about supporting research-track faculty across all career stages.

Additional research that can be done involves looking at faculty members of study sections at the NIH who are responsible for reviewing grant applications to develop an understanding of how their perceptions and beliefs about faculty appointments may impact their scoring. Members of study sections are typically tenured or tenure-track professors from academic institutions across the United States. Grant reviewers play a critical role in the review process and have a significant impact on whether or not a grant will be funded. Based on the findings in this study, participants often encountered questions from grant reviewers about their independence and qualifications. Insights about the scoring process gleaned from future research may be helpful to inform policy and practice of federal funding agencies.

Closing Thoughts

When I embarked on this project to learn more about research-track faculty and their work, I was familiar with the literature about non-tenure track faculty in the classroom. Literature about research-track faculty was scarce. The perceptions I formed of non-tenure track faculty from reading the literature prior to conducting this study were that this group often lacked resources, support, recognition, and inclusion in the institution where they worked. Although I discovered some parallels, such as low job security and lack of inclusion in governance, between the reported working conditions of non-tenure track faculty who teach and those I interviewed who do research, I was encouraged and inspired by the positive aspects of the research-track faculty experience at MedU.

Without exception, the participants in this study described MedU as a collaborative and collegial environment. The participants had the opportunity to pursue their careers how they saw fit, and they were motivated to do their best work. As more faculty members work in academia without tenure eligibility, institutions must develop ways to effectively incorporate these

members of the faculty into institutional life. I think MedU has made great strides toward doing this when it comes to research-track faculty. However, much more work needs to be done.

Efforts need to be made not only at institutions across the United States to effectively incorporate non-traditional faculty appointments into the fabric of the institution, but changes also need to happen within federal and non-federal funding agencies to address changing faculty careers in the research enterprise. Disciplinary societies and associations can also support efforts to re-define what it means to be a faculty member in light of ongoing conditions that are unlikely to change, and that constrain faculty careers. In the absence of significant change, there is an ongoing risk of losing new talent as people opt out, or are forced out, of careers in academia.

APPENDICES

APPENDIX A: Solicitation Email to Contract-Appointed Faculty Researchers

Dear Researcher:

My name is MaryJo Banasik, and I am a doctoral candidate in the College of Education at Michigan State University. I am reaching out to you because I am doing a dissertation study about the work experience of research faculty in biomedical sciences at a Research I institution with a career track for research professors and scientists.

Although research careers have been growing in academia, there is very little information about how people who are in these careers perceive their work environment. There has been recent discussion in academic circles about non-tenure track faculty in the classroom, but there has been very little research that considers the experience of research faculty.

Through this qualitative research study, I seek to develop an understanding of the work experience of research faculty while honoring their voices and confidentially capturing their perceptions. The Institutional Review Board at Michigan State University has reviewed the research protocol associated with this work and has determined that this research is exempt.

I am sending this email to you because I have identified you as a research scientist or a research professor at [MedU], the site where this research will take place. If you agree to participate in this study, you will participate in two semi-structured open ended interviews that will take up to two hours combined. The interview will be audio recorded and will be transcribed for data analysis. You will be assigned a pseudonym, and your identity will be kept confidential. Your institution will also be masked in the write up of the study.

I hope that you will consider participating in this important work. I am available to answer questions or to provide more information. I can be reached via email at banasikm@msu.edu, or by telephone at (517)432-7780. Dr. Roger Baldwin serves as a Chair of my dissertation and can be reached at rbaldwin@msu.edu. If you would like to participate, please let me know via email and I will contact you to make arrangements to meet.

Thank you for your consideration.

Best regards,

MaryJo Banasik

APPENDIX B: Research Participant Information and Consent Form

You are being asked to participate in a research study. Researchers are required to provide a consent form to inform you about the research study, to convey that participation is voluntary, to explain risks and benefits of participation, and to empower you to make an informed decision. You should feel free to ask the researchers any questions you may have.

Study Title: Academic Researchers Off the Tenure-track: Understanding Conceptions of Work
Researcher and Title: MaryJo Banasik, Doctoral Candidate
Department and Institution: Educational Administration, Michigan State University
Address and Contact Information: 784 Wilson Road, G100, East Lansing, MI 48824
banasikm@msu.edu; 517-980-5746

Sponsor: N/A

1. PURPOSE OF RESEARCH

You are being asked to participate in a research study seeking to understand how contract-appointed researchers in a Research I university with a Carnegie classification of highest research activity conceptualize their work environment.

You have been selected as a possible participant in this study because you have an appointment as a research scientist or research professor in biomedical sciences.

Your participation in this study will take up to two hours. Your participation will include one interview of up to 1.5 hours, and a second interview of up to 30 minutes.

In the entire study, up to 16 people are being asked to participate.

2. WHAT YOU WILL DO

If you agree to participate in the study, you will participate in two semi-structured open ended interviews that will take up to 2 hours combined. The interview will be audio recorded and transcribed for data analysis. You will be assigned a pseudonym, and your identity will be kept confidential. The interview questions will relate to your experience and perceptions as a research professor or research scientist.

I will share my findings with you at the end of the study.

3. POTENTIAL BENEFITS

Participation in the study may not be of direct benefit to you. However, your participation in this study may contribute to an understanding of how contract-appointed researchers conceptualize their work environment. Data generated from this study may provide relevant insights to

institutions reviewing or developing policies and practices specific to contract-appointed faculty, as well as to funding agencies seeking to encourage persistence in faculty research careers.

4. POTENTIAL RISKS

There are no foreseeable risks associated with participation in this study.

5. PRIVACY AND CONFIDENTIALITY

The data for this project will be kept confidential. A pseudonym will be assigned to each participant. Only the researchers will have access to participant names and pseudonyms which will be maintained in a password protected Excel file.

The researcher, supervising faculty member, Dr. Roger Baldwin, and the Institutional Review Board will have access to the data with the responsibility of maintaining the confidentiality of the data.

The results of this study may be published or presented at professional meetings, but the identities of all research participants will remain anonymous.

6. YOUR RIGHTS TO PARTICIPATE, SAY NO, OR WITHDRAW

Participation is voluntary. You may discontinue participation at any time without penalty or loss of benefits to which you are otherwise entitled.

- You have the right to say no.
- You may change your mind at any time and withdraw.
- You may choose not to answer specific questions or to stop participating at any time.

7. COSTS AND COMPENSATION FOR BEING IN THE STUDY

You will not receive money or any other form of compensation for participating in this study.

8. CONTACT INFORMATION

If you have concerns or questions about this study, please contact the researcher (MaryJo Banasik: 784 Wilson Road, G100, East Lansing, MI 48824, banasikm@msu.edu, 517-980-5746).

If you have questions or concerns about your role and rights as a research participant, would like to obtain information or offer input, or would like to register a complaint about this study, you may contact, anonymously if you wish, the Michigan State University's Human Research Protection Program at 517-355-2180, Fax 517-432-4503, or e-mail irb@msu.edu or regular mail at 4000 Collins Road, Suite 136, Lansing, MI 48910.

9. DOCUMENTATION OF INFORMED CONSENT.

Your signature below means that you voluntarily agree to participate in this research study.

Signature

Date

You will be given a copy of this form to keep.

13. The interviews for this study will be audiotaped.

- I agree to allow audiotaping of the interview.

☐ Yes

☐ No

Initials _____

The audio-recordings will be saved in password-protected file accessible only to the researcher.

APPENDIX C: Interview Discussion Guide

Interview 1, 1.5 hours

<p><u>Opener Questions</u> O1: Briefly describe your career path to your current position. O2: Describe your current position, role, and duties. O3: What drew you to this institution and current position? O4: Describe your work environment. Probes: Space? Colleagues?</p>	<p>Key: O: Opener Questions (Demographic Information) Some demographic information will be requested up front prior to the interview: With what gender do you identify? What is your national origin? For how many years have you been working as research faculty?</p>
<p><u>Research Questions</u></p>	<p><u>Interview Questions</u></p>
<p>Key: SA: Satisfaction OJ: Organizational Justice C: Closing Questions</p>	
<p><u>Satisfaction:</u> How and why are perceptions of job satisfaction implicated in non-tenure-track researcher professors' and research scientists' conceptions of their work?</p>	<p>SA1: Tell me about a time when you derived great satisfaction from your job. SA2: Imagine the ideal working environment. Can you describe it to me? SA3: How does this image align with or differ from your current work environment? SA4: If you could change anything about your job, what would it be?</p>
<p><u>Organizational Justice:</u> How and why are perceptions of organizational justice implicated in non-tenure-track research professors' and research scientists' conceptions of their work?</p>	<p>OJ1: Tell me about a time when your efforts were recognized by your department and or institution. OJ2: Describe the resources available to you to complete your research. How are resources distributed in your department? OJ3: Describe the expectations required of your position. How did you come to know what is expected? OJ4: Describe opportunities to advance in your position. How are efforts to advance encouraged? OJ5: How would you describe interactions with others in your department, such as with colleagues, the department chair? And outside your department? Can you give me</p>

	an example or two of a typical interaction?
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<u>Closing Question</u> C1: Is there any other information about your position or work environment you would like to share that we did not discuss today?	
Interview 2: 30 minutes	
<u>Visual Portrayal of Current Position</u> Intro: We are going to take a moment to engage in an exercise where you will be asked to sketch or draw a visual representation of your work, and then we will discuss it.	Spend 10 minutes drawing a visual representation of your position with one side reflecting what you like best about your job, and the other side what you like the least.
<u>Visual Portrayal Discussion</u>	Discuss the side with positive elements. Discuss the side with negative elements.
<u>Follow Up Questions</u> Based on review of the data acquired during the first interview, during this time I will follow up on any items that need clarification or further discussion.	

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