

**IDENTITY WORK AND SENSEMAKING BY
FACULTY APPROACHING TENURE**

by

Georgeanna F.W.B. Robinson

BA (Hons), University of Cambridge, 2001

MA, University of Cambridge, 2004

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This dissertation was presented

by

Georgeanna Robinson

It was defended on

July 21, 2010

and approved by

B. Jean Ferketish, PhD, Administrative and Policy Studies

Michael G. Gunzenhauser, PhD, Administrative and Policy Studies

Bennett Van Houten, PhD, Pharmacology and Chemical Biology

Dissertation Advisor: John C. Weidman II, PhD, Administrative and Policy Studies

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In recent years, federal grants for biomedical research have become increasingly difficult to secure, yet remain important for receipt of tenure in the biomedical sciences at research-intensive institutions. This study examines how pre-tenure biomedical faculty in a top research university cope with the threat of tenure denial that is due, in part, to the current NIH economy. It specifically focuses on the effect this experience may have on professional identities. Ten lower-funded and eight higher-funded faculty were interviewed about their professional identity, their experiences approaching tenure, and institutional support. The majority of the participants had strong professional identities as academic researchers. There was a clear sense among the majority that being funded is more important than receiving tenure. Unmet expectations existed regarding the nature of science and faculty work, academic freedom, independence, and the intense focus on funding. Several faculty described episodes of identity work. Some made conscious efforts to separate their professional and personal identities and another tried to integrate the two. Faculty used preventive identity work to inhibit future identity chasms and to cope with potential identity threats. Four types of professional identity work were displayed: reframing the nature of professional work, reframing the approach to work, reconceptualizing the professional self, and renegotiating the relationship of self to professional work. Faculty participants understood professional success in their institutional environment to mean receipt of biomedical research grants from the federal government. They exhibited a lack of clarity

regarding institutional expectations for tenure, and acknowledged that department chairs and mentors can help both in this regard and with developing a sense of community and fit. This research sheds light on the pressures experienced by those who may find cures for a plethora of public health issues in the future. Practical suggestions are provided to help medical school administrators wishing to support and enhance the productivity and comfort of junior faculty.

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PREFACE

“So that’s where being the scientist is not simply what you do anymore, right? It’s who you are. So if you can’t be who you are, then who the heck you gonna be?” - Peter, scientist

Scientists around the world toil endlessly for a small breakthrough that could supply one piece of a complex puzzle. Together, these multiple pieces lead to wide-reaching public health benefits. This dissertation is dedicated to all those who are driven to pursue new biomedical knowledge and find the cures of tomorrow.

I wish to express heartfelt thanks to John Weidman for his guidance along my doctoral path. I will never know how he makes time for all his advisees, but he has been generous in time, expertise, and kindness throughout my studies. My committee members each offered a unique contribution in their areas of knowledge and skill, and I thank them for their thoughtful suggestions and support. In conducting this study I depended heavily on the willingness of the eighteen faculty participants who gave up their precious time and opened themselves to my scrutiny. I am honored to present their stories.

My classmates and professors in the Higher Education Program have made the last three and a half years fun as well as interesting. I truly appreciate their friendship and patience with me in classes. I am particularly grateful to Quita Keller, who introduced me to the identity literature

and identity work after a chance encounter in a class; I owe the genesis of my theoretical framework to her love of reading and eagerness to share “cool papers.”

My mother and the rest of my family has been unfailingly supportive and interested in my coursework and research, and I appreciate their support despite their geographical distance. My husband, Dave, deserves special thanks. Having seen his doctoral journey, I was vehement that I would never embark on one myself, yet here I am, thanks to his encouragement. He has supported me throughout: starting me off with a good luck present on my first day of class, building a dissertation room in our attic, helping me refine my arguments by countering them with his eternally post-positivist stance, cheering my first “doctoral breakdown” as a major milestone, editing this dissertation, and providing expert graphical help. Dave’s patience and encouragement have been enormous; I could not have done it without him.

1.0 INTRODUCTION

This is a study of how biomedical faculty in an elite research institution cope with the threat of tenure denial that is due, in part, to the extremely competitive environment of federal funding. When receipt of federal research grants plays a notable role in academic advancement, what happens to lower-funded faculty at premier research institutions? This study examines how faculty make sense of the influence that National Institutes of Health (NIH) funding has on the tenure decision, and describes any resultant changes in their professional identities. The purpose of this study is to determine in what types of identity work, if any, these faculty engage and how they make sense of this experience.

New faculty face increasing career pressure because funding patterns for academic biomedical research have changed dramatically in the past decade. Between 1998 and 2003, the NIH budget doubled from \$13.6 billion to \$27 billion (National Institutes of Health, 2007). After the doubling period, annual growth rates of the NIH budget fell to below both the rate of inflation in the wider economy and the NIH's biomedical inflation index (Koizumi, 2006), with the real value falling 13% between 2003 and 2008 (Teitelbaum, 2008). The number of applications in 2007 for the "R01" independent investigator grants, considered the mainstay of NIH individual research grants, increased almost 48% over 1998 (National Institutes of Health, 2008). As a result, success rates for competing applications fell to 16% in 2006 and improved

only slightly by 2008 to 19% (Steinbrook, 2009), falling back down to below 18% in 2009 (National Institutes of Health, 2010), as shown in figure 1.

In 2009, the American Reinvestment and Recovery Act of 2009 (“The Stimulus”) added \$8.2 billion to the NIH budget to support research for two years (Steinbrook, 2009), to be followed by a return to earlier funding levels. Announcement of The Stimulus generated widespread excitement in the biomedical community and sparked an unprecedented number of grant applications. Many unfunded Stimulus grants are expected to be resubmitted under normal funding mechanisms, causing NIH officials to predict independent investigator grants success rates below 5% during FY10 (Wadman, 2009) – a steep decline from current levels.

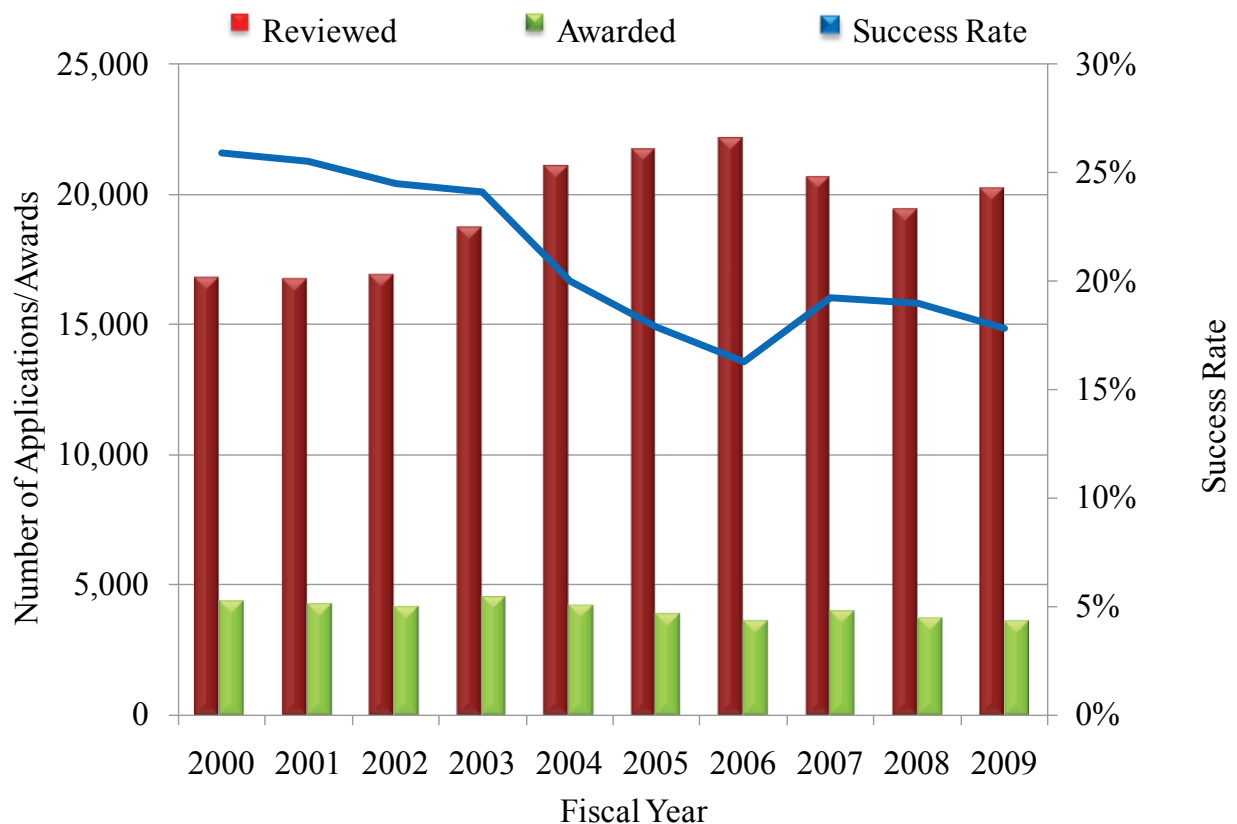


Figure 1: Success rates of independent investigator research project grants at the NIH

(National Institutes of Health, 2010)

1.1 PROBLEM STATEMENT

Given the current and anticipated continuing low funding levels, and the importance of funding for PhD faculty in the tenure decision, the occurrence of tenure denial may increase for biomedical faculty. This possibility creates a high level of uncertainty and may lead to a questioning of professional identity by pre-tenure faculty. As this situation becomes more common, it is increasingly important to understand how the experience of potential tenure denial may affect faculty members' understanding of themselves as researchers and their subsequent career aspirations.

For those contemplating tenure denial, the main alternatives traditionally offered include moving to a teaching-oriented university, working as a research scientist in another faculty member's laboratory, or simply leaving science. The last option is likely to involve significant questioning of the individual's identity as a scientist, since those who leave science at this stage of their career may have invested more than fifteen years in the profession – experience and skills that could be lost. A more constructive outcome of identity work may result in faculty redefining their professional identity and role, perhaps more as a teacher or non-independent researcher. Recently, as the number of scientific graduate students entering academia had declined, there has been increased attention upon other ways that scientists can be usefully employed in society (Alberts, 2009), but no avenues have taken root as a clear alternative to the three above.

The predicted decline in funding levels is likely to affect biomedical research faculty careers at elite biomedical research institutions. In the biomedical research field, elitism is a function of federal (most often NIH) research dollars awarded to institutional faculty. Receipt of grants increases prestige and provides income for institutional administrators to upgrade facilities

or hire the best new faculty. In this way, NIH funding has created a “pseudo market environment” (Clawson, 2009) in the biomedical research field, with medical schools engaging in academic capitalist activities (Robinson, 2009).

Among medical schools and universities with high levels of NIH funding, there appears to be recognition that an independent investigator grant, and sometimes two (or renewal of the first) is necessary for tenure (Ascoli, 2007). These grants are held in high esteem by tenure and promotion committees because they are subject to rigorous peer review. Receipt of one therefore signifies that scientists in related fields deem the applicant’s research to be focused on a worthy problem, and support the applicant’s ability to design and conduct the work independently. Thus, an independent investigator grant helps researchers develop recognition as an expert in their field. Supporting the frequently unwritten favor of tenure committees towards funded investigators, the director of the Ohio State University Comprehensive Cancer Center recently stated that “failure to get an [independent investigator] grant [negatively] affects an investigator’s chance of being promoted within the university” (Printz, 2009, p. 3488).

To assist new faculty in starting their careers, the payline (the score that delimits successful and unsuccessful applications) for grants by new investigators is frequently higher than other grant applicants, meaning that a greater proportion of new applicants are funded (Johnston & Hauser, 2009). However, when these same investigators try to renew grants or win a second one, they are no longer advantaged in this way. To compound the problem, they are competing against well-established senior investigators, who receive three times more funding than junior faculty (Moses, 2009). Although junior faculty who have been funded may understand this competitive environment on a theoretical level, they may still be surprised when encountering the reality of their lack of subsequent funding success, despite receiving supportive reviews and previously fundable grant scores. To worsen the situation, such faculty may be just a

few years away from the tenure decision, adding to their perceived pressure to increase their research funding.

Researchers with MD degrees may be able to supplement their research funding with clinical income, thus appeasing deans and chairs who urge faculty to acquire salary support from institutional or non-departmental sources. Faculty with PhDs, however, do not have this extra income source available to them. More than one third of faculty in academic medical centers in the United States focus on basic research and have a PhD, as opposed to those who have an MD or MD and PhD (Zinner & Campbell, 2009). Basic research (“bench science”) involves the generation of new knowledge, and in the biomedical fields can be the furthest stage from directly improving healthcare outcomes. Other steps in developing new treatments include translational research, so called because it “translates” the findings of basic research into clinically-relevant situations, and clinical trials, where the findings are tested in humans. Industry sponsors are frequently interested in the later stages of research, as their profits depend on drug sales. Therefore, it should not be surprising that one study of faculty at the fifty top NIH-funded medical schools found that only 8.6% of basic science researchers had an industry relationship, compared to 48.2% of researchers involved in clinical trials (Zinner & Campbell, 2009). This picture underscores the importance of federal funding to basic research, and thus the weight attached to securing NIH funding for assistant professors in the biomedical sciences who hold PhDs and work in a research-intensive institution.

1.2 SIGNIFICANCE

This study is important because it will likely lead to an understanding of how the professional identities of faculty change as a result of their experiences facing potential tenure denial. This new knowledge is intended to help administrators guide faculty to a position that can most constructively use their skills and knowledge, even if tenure is not granted.

1.3 RESEARCH QUESTIONS

The overarching research question of this study is, *how do pre-tenure biomedical faculty in a top research university cope with the threat of tenure denial that is due, in part, to the current NIH economy?* To answer this broad question, I propose four sub-questions:

- 1) How do these faculty make sense of the threat of tenure denial and their funding experience?
- 2) How does this experience shape the faculty members' professional identities?
- 3) In what types of identity work do these faculty engage?
- 4) What aspects of the institutional experience are related to participants' sensemaking and professional identities?

I examine these questions through the framework of paths of sensemaking and episodes of identity work. To do so requires a thorough understanding of identity, professional identity formation in academia, biomedical faculty careers, sensemaking, and identity work. These topics form the basis of the literature review that follows. The review provides a theoretical framework

for these questions that will be explored in the specific funding environment and institutional context outlined above.

1.4 DEFINITION OF TERMS

Higher-funded: Faculty who conduct research full time and have two or more R01s, or one substantial NIH grant and additional funding from a foundation or health association, or who covered more than 75 % of their salary on grants.

Lower-funded: Faculty who conduct research full time and have one or no R01, or who covered less than 75% of their salary on grants. If faculty in this group had one R01, it was due to expire prior to their tenure decisions and they had not have successfully renewed it at the time of interviews.

NIH: National Institutes of Health, the government organization that funds the majority of biomedical research in the United States of America.

PI: Principal investigator, a faculty member who leads his or her own independent research agenda.

R01: An independent investigator grant from NIH, which is considered the mainstay of research funding for PIs and, since it is rigorously peer-reviewed, is a hallmark of peer recognition and success.

2.0 LITERATURE REVIEW AND CONCEPTUAL FRAMEWORK

This review provides a detailed understanding of the concepts of identity, sensemaking, and identity work, and offers a theoretical framework through which the problem of untenured, low funded biomedical researchers can be studied. Identity is covered first. Although identity has been examined in various disciplines, this review is predominantly drawn from the organizational literature, from which the majority of identity work studies emerge. Organizational scholars have published a comprehensive body of research covering the many facets and multiple layers of identity: social identity theory, role theory, role identity, organizational identification, and professional identity. These areas are important to understand because they can all play a part in how individual researchers understand themselves as a faculty members, and how this self-understanding may change as a result of their funding experiences.

Of relevance to the study of faculty professional identities is how they are developed. The professional identity formation of faculty is a well-studied field. Graduate student socialization and the challenges of early faculty life are integral to the development of an academic professional identity. Some of the key issues and literature in these areas are outlined within the second section, which concludes with a brief examination of biomedical faculty careers.

The third section focuses on sensemaking and relies heavily on the work of Karl Weick, a leader in the field. Intended to give an outline of the concept of sensemaking provided in his

book (Weick, 1995), this section is also augmented by his subsequent research and others' earlier work on surprise (upon which Weick drew).

The fourth section introduces the idea of identity work, whereby individuals attempt to build a coherent, consistent and positive sense of self. Identity work is a young but expanding field; some studies portray a particular aspect of identity work or describe identity work in action within a specific context. However, there are few instances of authors reviewing multiple cases of identity work to discover patterns or design a model. I therefore group the studies in this review by type of identity work. Within each broad group, I describe various examples of identity work from different studies.

Following the review, I explain how the literature serves as a conceptual framework for my proposed study.

2.1 IDENTITY

In this section, I outline the concept of identity and the multiple types and layers that comprise an individual's identity. I briefly describe social identity theory, role theory, role identity, organizational identification, and professional identity. This section provides a broad understanding of identity before covering the process, components, agents and notable hindrances to academic professional identity formation.

Identity is a nebulous concept, an "enigma" (Albert, Ashforth, & Dutton, 2000). Attempts to describe identity have included "the various meanings attached to a person by self and others" (Ibarra, 1999) and "a reflexively constructed life narrative" (Lutgen-Sandvik, 2008). However, rather than offering a definition of identity, many authors choose to offer the question "who am

I?”, the answer to which is understood to be one’s identity (e.g., Alvesson, Ashcraft, & Thomas, 2008; Ashforth, Harrison, & Corley, 2008; Kreiner, Hollensbe, & Sheep, 2006b; Lutgen-Sandvik, 2008; Sargent, 2003; Sveningsson & Alvesson, 2003). Expanding on this question, Alvesson, Ashcraft, and Thomas (2008) offer the following description of identity:

Identity loosely refers to subjective meanings and experience, to our ongoing efforts to address the twin questions, ‘Who am I?’ and – by implication – ‘how should I act?’. One’s personal identity implies certain forms of (often positive) subjectivity and thereby entwines feelings, values and behavior and points them in particular (sometimes conflicting) directions. (p. 6)

One of the reasons identity is a challenging concept is that it is “temporary, context-sensitive and evolving” (Alvesson et al., 2008, p. 6). Given the fluid nature of identity, the articulation of one’s identity at one moment may not be appropriate in another situation.

Identity is central to human behavior. It affects how people act, both as an individual and as a member of an organization or group. It allows the development of meaning and purpose in life (Albert et al., 2000; Sargent, 2003; Sveningsson & Alvesson, 2003), and is also pivotal to motivation, commitment, loyalty, logics of action, and decision-making (Sveningsson & Alvesson, 2003). By understanding how to act in accordance with their identity, individuals feel situated in a social context (e.g., worklife, family, church). Particularly in situations where an individual may feel uncertain or that their usual flow of life has been disrupted, identity provides guidance on how to act; it “serves as a rudder for navigating difficult waters” (Albert et al., 2000, p. 13).

2.1.1 Social identity theory

Whereas individual identity is a unique sense of self, social identity is “that part of an individual’s self-concept which derives from his knowledge of his membership of a social group (or groups) together with the emotional significance attached to that membership” (Tajfel, 1974, p. 69). Social identity theory examines how people categorize themselves into groups and, based on this grouping, understand themselves and their behavior (Tajfel, 1974). The classification is based on typical characteristics of abstract group members (Ashforth & Mael, 1989) and is influenced largely by others’ categorization of the individual. Each person is likely to assign varying degrees of importance to the different social groups with which they identify or are identified, with some overlap likely among group memberships. This subjective representation of multiple group memberships has been termed social identity complexity (Roccas & Brewer, 2002). Given the interplay between others and the self in identity construction, current conceptions of identity “thus have the paradoxical nature of both being a property of a self, and a property given to a self based on association with others” (Renn, Dilley, & Prentice, 2003, p. 191).

The purpose of categorization is to provide a cognitive system through which to define oneself and others in the social environment (Ashforth & Mael, 1989), thereby reducing uncertainty in interactions and creating order in one’s environment (Ashforth et al., 2008; Kreiner, Ashforth, & Sluss, 2006). Additionally, by identifying with a collective, one has access to the meanings the group attributes to specific events and attitudes pervasive among group members. This too helps individuals order and make sense of their environment (Ashforth, 2001). Individuals usually identify with collectives that they assess positively, so that by identifying with them they are enhancing their status and self-esteem (Ashforth & Mael, 1989;

Kreiner, Ashforth et al., 2006; Sluss & Ashforth, 2007). Other motives for identification with a group include self-expression, self-coherence, and self-continuity (Ashforth et al., 2008). A high degree of social identity complexity (i.e., identifying with multiple groups that have little overlap in membership and whose members differ distinctly from those of other groups with which the individual identifies) makes it more likely that a person will be inclusive of those who differ from him- or herself. This is important because people with a more easily accessible membership in any particular group are likely to cope cognitively with group threat and negative events (Roccas & Brewer, 2002). For example, if any one group to which an individual belongs becomes stigmatized, that individual can draw on the elements of their identity that are associated with memberships in other groups. Thus the individual prioritizes a non-stigmatized group membership, allowing a positively assessed identity to come to the fore.

The process of identification can be managed by groups, hence the socialization processes common in organizations and during professional training. Through identification, the individual comes to self-define as part of the group, to act in a manner congruent with the group's social identity and to reinforce group-appropriate behaviors (Ashforth & Mael, 1989). As members of a group, people adopt a role within it, which further guides their identity.

2.1.2 Role theory

A role is “a position in a social structure,” the meaning of which, and “the way in which an individual *enacts* a position[,] are negotiated within structural constraints” (Ashforth, 2001, p. 4, emphasis in original). As such, there exist in society and within organizations commonly held notions of what a particular role means – how role incumbents should behave, what they should think, do, and feel (Sveningsson & Alvesson, 2003). They offer a “prefabricated self” (Ashforth,

2001, p. 15) that is available for an individual new to an organization or position to adopt. Adoption of a role affects an individual's identity in that it provides guidance on how the individual should act in role-relevant situations. In so doing, the individual self is submerged to some extent as one "becomes a microcosm of the collective or role" (Ashforth et al., 2008, p. 359) and acts in the interest of the collective.

Individuals commonly have multiple roles that may be professional (manager, accountant, lawyer) or social (parent, spouse, friend, church member), as well as transient roles such as, for example, store customer or bus passenger. In any interaction, individuals may draw on any relevant role to guide their behavior. These multiple roles are believed to be hierarchically organized such that the role that is salient in the greatest number of situations is at the top of the hierarchy, and is therefore the most accessible for the individual to adopt. A sense of identity can be maintained by the intentional management and prioritization of roles (Jain, George, & Maltarich, 2009).

Roles are thus socially-constructed abstractions. However, in usual circumstances, "individuals have some latitude or personal space in enacting the role-based identity according to their needs and preferences" (Sluss & Ashforth, 2007, p. 12). Therefore how a role is enacted is a function of both the personal and social identities. The behavior of the person filling the role is driven not just by social expectations of how that role should be enacted, but also by the person's own sense of self (personal identity) and by the values and culture of role-relevant groups (social identity).

As an individual embodies a social identity or a role, there may be identity enhancement in the form of "reflected appraisals" (Kaufman & Johnson, 2004), whereby the individual's self-perceptions are formed as a result of how others perceive them. If one's self-concept differs from how group members or society sees one, then work is required to create consistency between the

two (Kaufman & Johnson, 2004). Similarly, there may be inconsistencies between social expectations of in-group or role-appropriate behavior and personal self-concept. When this happens, individuals craft their role based on their own personal identity, albeit one that has been somewhat shaped by the social context, creating a hybrid role-identity.

2.1.3 Role-identity

A role-identity is a “socially constructed definition of self-in-role” (Ashforth, 2001, p. 27). As David Sluss and Blake Ashforth (2007) note, “social identity theory speaks only to interaction between depersonalized and therefore relatively static entities – entities that lack the color, nuances and vagaries that define individuals and shape their interactions” (p. 17). They use relational identity – the nature of a relationship (e.g., manager-subordinate) – and relational identification – the extent that the identity inherent in the relationship (e.g., manager or subordinate) forms a part of the self definition – as a means of guiding the personal enactment of a social identity and role.

Influenced by societal and organizational expectations and norms, individuals “think, feel and act their way into identification” with a role (Ashforth et al., 2008, pp. 359-360), but only through feedback and social validation via relationships with strong relational identification is the identity firmly embedded and established as legitimate. Role-identity is therefore the nexus between a role, one’s social identity and one’s personal identity, as explored by Tony Watson (2008) in a study of the personalization of managerial roles. Without the opportunity to “craft” (Wrzesniewski & Dutton, 2001, p. 179) a role in an organizational context, individuals are likely to be frustrated and experience the “potential identity malaise of getting stuck with a script that one could perform but not personalize” (Sveningsson & Alvesson, 2003, p. 1181). By making an

organizational role their own, individuals are more likely to find meaningful work and contribute successfully to organizational goals (Wrzesniewski & Dutton, 2001).

2.1.4 Identity is multi-leveled

Given the existence of a personal and social identity, as well as an abstract role and the subsequent personalization thereof, it is evident that identities are multi-leveled. The personal identity provides a unique sense of self, and the social identity offers group inclusion. The latter comes to the fore in interacting with others – particularly with those not in the same social group. The role helps one understand what actions, thoughts and behavior may be expected, and the role-identity allows for personalization of the role based on personal and social identities.

Within these multiple levels or layers, elements of one's identity differ in salience, stability and accessibility for any given situation (Kreiner, Hollensbe, & Sheep, 2006a). Extending the concept of different layers and elements of identity, people are said to have multiple identities – a “repertoire of identities” (Kreiner, Hollensbe et al., 2006a) – that allow them to respond better to any number of situations, since they have a wider array of frames of reference upon which to draw (Pratt & Foreman, 2000). Researchers are divided as to whether these identities are arranged in an integrated hierarchy or are fragmented and constantly shifting within an amorphous notion of self (Alvesson et al., 2008).

These levels of identity all contribute to a “global identity,” defined by Blake Ashforth (2001) as follows:

Those portions of the individual's personal and social identities (including role identities) that are integrated into a roughly coherent self-system or self-theory.

As such, the global identity may consist of goals, values, beliefs, traits, competencies, time horizons and ways of acting, thinking and feeling. (p. 35)

A final element of the global identity is provided by membership in an organization – frequently an individual’s place of employment.

2.1.5 Organizational identification

As a type of social entity, an organization is a collective with which people identify. Organizational identification occurs when people “define themselves at least partly in terms of what the organization is thought to represent” (Kreiner & Ashforth, 2004, p. 2). Identifying with one’s employing organization helps make work meaningful, provides a sense of control, and promotes a better perception of organizational fit (Ashforth, 2001). As a result, employees are more likely to be committed to their work, perform better, and remain with the organization for longer (Kreiner & Ashforth, 2004). It should be noted that while an individual can experience organizational identification, the organizational identity represents the collective priorities, values, and culture of the organization.

In a recent exploration of organizational identification, Glenn Kreiner and Blake Ashforth (2004) expanded the previous, bivariate, conception of organizational identification (to identify or not with the organization), testing a model that includes three types of organizational identification beyond positive identification: disidentification, ambivalent identification and neutral identification. Disidentification occurs when an individual asserts that (s)he does *not* identify with an organization or major part thereof. This could be prompted by a negative reputation, conflict between the individual’s self-concept and organizational role, or a sense that the organization has betrayed the individual. Ambivalent identification occurs when an

individual identifies with the organization on some levels but disidentifies with it on others. As a result, a sense of not being a prototypical organizational member arises. The differences may be significant enough for the individual to perceive conflicts between organizational and personal values or priorities. The authors theorize that ambivalence may be a precursor to disidentification because the person is failing to enact the typical organizational member role. Neutral identification occurs when an individual's identity is largely unaffected by organizational membership, either positively or negatively: their identity is not linked to their organizational membership. This is typical of people with a well-developed personal identity that does not rely on the organization or social group for individual definition. Organizational identification is thus relevant to some extent for the identity formation of many types of employees. Distinct from, but related to, organizational identification, is the concept of a professional identity.

2.1.6 Professional identity

Based on the notion of medieval guilds, professions are intended to be self-regulating, with the individual working autonomously and the collective operating an occupational monopoly in performing specialized, non-routine tasks that require expertise and judgment (Adler, Kwon, & Heckscher, 2008; Bragg, 1976). As such, professions develop distinct cultures within which professionals operate. Professionals are thus likely to identify not only with their organization but also with their profession, which provides a professional with a national or international network with which to identify. The strong cultural forces in a profession allow it to exist as a recognized entity, but can also subjugate individual identity for the sake of professional identity.

Professional identity is “the relatively stable and enduring constellation of attributes, beliefs, values, motives and experiences in terms of which people define themselves in a

professional role” (Ibarra, 1999, p. 764). It is a specific type of work identity, defined as a “work based self-concept” (Walsh & Gordon, 2008, p. 47) that embodies also the culture of the profession. With a considerable portion of adulthood spent working, occupations can serve as “major identity badges” (Ashforth et al., 2008, p. 350) that help the individual self-define both inside and beyond the employing organization. Similar to Henri Tajfel’s (1974) definition of social identity earlier, professional identification is the extent to which individuals define themselves in relation to the work that they perform. Professional identity, therefore, is one type of social identity that is of primary relevance at work (Kreiner, Hollensbe et al., 2006b; Walsh & Gordon, 2008). However, it is not only relevant in the workplace because, as an identity that is often of frequent salience and readily accessible, it contributes to the repertoire of identities upon which individuals can draw in any situation, provides status in a number of social interactions, and can act as a means for self-verification (Sargent, 2003).

Professional identity is subject to the interactions of three key forces: the individual identity, society’s expectations of what the role entails and how the incumbent should act (which is guided by professional norms), and the organization’s normative behavior and values (Kreiner, Hollensbe et al., 2006b). It thus draws on several of the identity-related theories outlined above. Adherence to professional norms and the development of a professional identity is important for both the profession and the professional. They allow the professional to act in a manner consistent with social expectations in their daily performance of the profession, engendering trust and respect. For the individual, professional identification is positively correlated with job satisfaction and organizational commitment (Loi, Ngo, & Foley, 2004).

Professional identity formation occurs in its most concentrated form during the early years of entering a profession (Dobrow & Higgins, 2005). During the training period, future professionals learn not only the necessary skills but also internalize the value systems of their

chosen professions (Weidman, Twale, & Stein, 2001). The training process and period vary among professions. Relevant to this study is how faculty at research institutions are socialized into academia and form their professional identities.

2.2 ACADEMIC PROFESSIONAL IDENTITY FORMATION

In this section, I describe the process, challenges, and contributors to graduate student socialization. In the biomedical sciences, it is most common for graduate students with academic aspirations to embark on postdoctoral training, during which their professional identity continues to develop. There is little literature on the postdoctoral years, so this review is informed by the literature that assumes a continuation from graduate school into a junior faculty position. Although the timing of some of the processes and challenges may differ, I rely on the framework of the more general academic professional identity formation in the literature as informative also to the careers of biomedical faculty.

2.2.1 Graduate student socialization

In academia, the professionalization process is generally considered to begin in graduate school, as evidenced by the significant body of literature on graduate student socialization (Austin & McDaniels, 2006; Bess, 1978; Bragg, 1976; Colbeck, 2008; Gardner, 2007; Gardner & Barnes, 2007; Golde, 1998, 2000; Major & Dolly, 2003; Sweitzer, 2009; Walker, Golde, Jones, Bueschel, & Hutchings, 2008; Weidman & Stein, 2003; Weidman et al., 2001). For graduate students who identify a faculty position as their career goal and persist to graduation, a number

of challenges to joining the faculty remain. Most notably, students' conceptions of faculty careers are likely to be both incomplete and glamorized (Austin, 2002; Gaff & Pruitt-Logan, 1998; Reybold, 2003; Wulff & Austin, 2004). Due to each graduate student's own set of experiences and identity, the end point of graduate student socialization is an individualized notion of what it means to be a faculty member. Therefore, the socialization process differs for each student according to their personal interpretation of events (Weidman et al., 2001).

Nevertheless, there are some elements that are recognized as being at the core of graduate student socialization: knowledge acquisition, investment, and involvement, as well as exposure to the many facets and tasks of academic life so that expectations of the future career may be appropriately formed (Gaff, 2002; Thornton & Nardi, 1975). Of the four stages of socialization that are commonly discussed in the literature – anticipatory, formal, informal and personal (Weidman et al., 2001) – the personal stage is most relevant to faculty professional identity formation. It is here that emphasis is placed on the individual's expectations and conceptions of their role (Thornton & Nardi, 1975). For graduate students, this is the point at which prior self concept and understanding of the academic professional role is fused with the newly emerging professional identity. As graduate students begin to consider careers after doctoral study they experience role gain – that of an independent scholar and a professional, and role loss – no longer feeling like a graduate student (Gardner, 2009).

During graduate school, students can be considered apprentices; they learn the disciplinary knowledge and skills, model faculty behavior, and learn to operate within the institutional culture. This professionalization is dependent on a number of socializing agents in addition to the individual, who brings a unique set of experiences, personality traits, innate skills, and susceptibility to socialization (Sweitzer, 2009). Faculty, particularly advisors, are naturally key to academic socialization (Boyle & Boice, 1998; Bragg, 1976; Green & Bauer, 1995), as is

the student's department or program as an entity (Anderson & Swazey, 1998; Gardner, 2007). Student peers are also important socializing agents as sources of tacit knowledge (Golde, 2000), members of an informal and safe community within which to test interpretations (Weidman et al., 2001), support for managing workloads and milestones of graduate study (Austin, 2002; Conrad, Duren, & Haworth, 1998; Gardner, 2007), and opportunities for intellectual growth through informal discussions of course material (Conrad et al., 1998). Support networks of family and friends outside academia contribute to socialization in that they influence the individual's social identity. They can also provide the means for a student to spend more time on campus engaged in academic life, away from the demands of family life or financial needs.

Upon the completion of graduate school, it is hoped that students have an integrated professional identity as a future faculty member and that they have developed the core competencies for faculty life: conceptual understandings, knowledge, and skills in key areas of faculty work, interpersonal skills, and professional attitudes and habits (Austin & McDaniels, 2006). Graduate work is commonly followed by postdoctoral training for biomedical scientists with the result that, by the time a biomedical scientist enters a faculty role, he or she may have been in the academic scientific environment for ten to twelve years (four to six in graduate school and the same again in postdoctoral positions).

2.2.2 Professionalization as a junior faculty member

During the early faculty years, a further professionalization process occurs as the new faculty member forms and solidifies a professional identity. Unfortunately this is rarely a smooth process; junior faculty members often encounter a variety of organizational, personal, academic, and social hindrances and complications. Having been socialized academically during graduate

school to their institution and at least some aspects of the type of work expected, new faculty are likely first to encounter organizational challenges such as learning their new institutional culture, and how relationships and individuals function in the new institution (Dowd & Kaplan, 2005; Finkelstein & LaCelle-Peterson, 1992; Reybold, 2005; Whitt, 1991). As part of understanding the culture and people of their new organization, new faculty also begin to be aware of, and attempt to interpret appropriately, the expectations members of their new departments and institutions are likely to have of their newest colleagues, both in terms of work responsibilities and requirements for tenure (Austin, 1992; Austin & Rice, 1998; Brown, 2006; Gaff, 2002; Mullen & Forbes, 2000; Olsen & Sorcinelli, 1992; Whitt, 1991). Time management and difficulties with balancing the multiple professional demands are also likely to emerge and interfere with the individual's personal life and stress levels (Austin, Sorcinelli, & McDaniels, 2007; Brown, 2006; Menges, 1999; Rosch & Reich, 1996; Rosser, 2003; Sorcinelli, 1992; Ward & Wolf-Wendel, 2004).

As the new faculty member settles into organizational life, doubts concerning his or her ability to meet the professional responsibilities and expectations presented by the institution are likely to arise (Austin et al., 2007; Moyer, Salovey, & Casey-Cannon, 1999), with the faculty member receiving little feedback to allay these fears (Austin, Connolly, & Colbeck, 2008; Trautvetter, Braskamp, & Ward, 2008). As stress levels rise, the faculty member may sense some incongruity between initial expectations and the emergent reality (Bogler & Kremer-Hayon, 1999; Olsen & Crawford, 1998; Reybold, 2005; Reynolds, 1992; Rosch & Reich, 1996). If the reality is not one to which the individual feels able to adapt, the new faculty member may believe that he or she does not belong at the institution (Dowd & Kaplan, 2005; Lindholm, 2003; Reybold & Alamia, 2008).

2.2.3 Biomedical faculty careers

Academic careers in the biomedical sciences begin in graduate school during doctoral training. After graduation, scientists with academic aspirations generally conduct postdoctoral research, which is considered part of the individual's training. These positions are chosen based on an interesting research topic, good publication prospects, and the reputation of and rapport with the principal investigator (PI) (Bonetta, 2008). In addition to learning new skills and becoming familiar with a wider array of techniques and fields than may have been possible during their graduate years, postdoctoral researchers use this time to build their reputations and curriculum vitae by publishing peer-reviewed papers, presenting at conferences, and creating collaborations that will help their future, independent careers.

In a large survey of postdoctoral researchers, 96% of respondents indicated they were interested in pursuing a career at a research university (Davis, 2005). However, the transition to a tenure track position is highly competitive. With the proportion of tenure track jobs declining (Bunton & Mallon, 2007), postdoctoral researchers increasingly need to have a wide range of techniques and a clear vision for their independent research. As a result, it is common to have two or three postdoctoral training positions in different laboratories, each lasting an average of 2.8 years ("Assessing the postdoc experience," 2008) before moving to a faculty position. As a result, the average age of new assistant professors in the biomedical sciences in 2006 was 37.7 (American Academy of Arts and Sciences, 2008). Little research exists on the postdoctoral population, however even with 5-8 years of postdoctoral training, anecdotal evidence from postdoctoral affairs professionals (personal communication) suggests that only about one third of postdoctoral researchers secure tenure track positions.

In an attempt to facilitate the transition from postdoctoral fellow to tenure track faculty member, the NIH created a “Pathway to Independence” grant, called a K99/R00, in 2006. This funding mechanism provides two years of postdoctoral financial support while the individual remains in a mentor’s laboratory, followed by three years of R01-level funding that is portable to the individual’s new institution. These grants make a young scientist attractive to a hiring institution, as the individual has demonstrated success at securing NIH funding. In 2009, the success rate of K99 applications was 29% (National Institutes of Health, 2010), with 204 awards made during the year. The relatively high success rate compared to research project grants, fewer than one in five of which are funded, could be a result of this funding mechanism being only in its fifth year. It is logical that as the popularity and importance of K99 grants increases, the success rate will decrease unless a commitment is made by the NIH to increase the number of awards.

Whether an individual has a K99 or not, new faculty often receive start-up funding from the institution to stock and staff their laboratory as part of an offer for a tenure track position. The intent of this funding is to allow the faculty member to gather enough data to secure federal or foundation funding that will support their future research. Expectations of the proportion of a PI’s salary that should be covered by grant support vary between institutions and even departments at the same university. Junior faculty may seek initial funding through a smaller federal grant, such as the R21 “Exploratory/Developmental Research Grant Award” from the NIH, or through smaller foundation grants. After sufficient preliminary data has been gathered, however, most tenure track faculty at research-intensive medical schools are likely to feel pressure to apply for an R01 independent investigator award. The intense competition in recent years and the central importance of securing this type of grant was highlighted in the earlier problem statement. In 2006, the average age of new recipients for independent investigator

grants was 42.4 (American Academy of Arts and Sciences, 2008), suggesting an average of 4.7 years from appointment as an assistant professor to receipt of their first grant of this kind.

During the early junior faculty years, in addition to securing funding, faculty have other academic obligations, such as mentoring, teaching, internal and external service, and publishing their research. These factors combine to produce significant time pressures (Austin et al., 2007; Rosch & Reich, 1996), potential confusion over priorities (Sorcinelli, 1992), and institutional expectations (Austin & Rice, 1998; Austin et al., 2007; Whitt, 1991), as noted earlier. These factors are common to junior faculty in many fields; perhaps specific to the biomedical sciences, however, is the pressure to secure and maintain funding. The pervasive and relentless nature of this pressure must be clearly understood to appreciate the culture within which faculty operate, and therefore the institutional and social forces that can affect their identities.

2.2.4 Summary

If these many challenges to professional identity formation, academic confidence and success, and organizational fit are overcome, the faculty member may be several years into an assistant professor position and therefore approaching the tenure decision. In the biomedical sciences, by the time an assistant professor begins to compile a tenure dossier, he or she may have been operating within the culture of academic science for as many as fifteen years. Socialized to academic research as a graduate student and postdoctoral fellow, the faculty member builds and solidifies his or her professional identity over the first years of a faculty position, becoming accustomed to faculty worklife and institutional norms. The faculty member's professional identity might be relatively stable by the time of the tenure decision, but any threat to tenure could destabilize it. In response, the faculty member may engage in

sensemaking or identity work to discern whether (or how) their professional identity has been influenced by this threat, and therefore what action might be appropriate.

2.3 SENSEMAKING

Based on Karl Weick's (1995) theory of sensemaking, this section outlines the elements and process of sensemaking, finishing with two related concepts: sensebreaking and sensegiving. These two concepts form a bridge between sensemaking and identity work, which is the focus of the final section of this review.

Sensemaking is invoked when daily life is interrupted by an event that is both unexpected and implausible, or, as Karl Weick (2005) introduces the idea, when "people think to themselves, it can't be, therefore, it isn't" (p. 1). It involves "placing stimuli into some kind of framework" (Weick, 1995, p. 4) through which an individual can begin to understand, explain, and interpret, a particular series of events, and from that, extrapolate and predict future courses of action. It orders the chaotic and makes the extraordinary ordinary (Ashforth, 2001).

Sensemaking is distinct from interpretation in that it involves more action and "authoring" (Weick, 2005, p. 7) of events in addition to reading and interpreting. In a revision to his earlier work, Weick (now working with two co-authors) conceived of sensemaking as more "action oriented, ... meshed more boldly with identity, more visible, more behaviorally defined, less sedentary" (Weick, Sutcliffe, & Obstfeld, 2005, p. 409). Three key questions are involved in Weick's notion of sensemaking: "how do I know what I think until I see what I say?" (Weick, 1995, p. 18), "what's going on here?" (or "what's the story?") and crucially, "what do I do next?" (Weick et al., 2005, p. 410 and 412). Thus, sensemaking is a mechanism for crafting

one's own comprehension of what has happened, and based on this understanding, designing a future course of action.

Weick's work draws on the earlier work of Meryl Louis (1980) concerning surprise among organizational newcomers. She posited that when events are not experienced as expected, individuals seek some form of explanation for the discrepancy. The individual interprets the discrepancy through his or her own lens and attributes meaning to a surprise. Based on that meaning, any subsequent action is ascertained, and the understanding an individual has of the environment and any related expectations are revised. Thus sensemaking is seen as a cyclical process of managing expectations and reality.

Weick (1995) expands on this retrospective sensemaking of surprises, and identifies the typical sequence of events that are critical to sensemaking: 1) someone notices something in a flow of ongoing events that does not fit and that is surprising; 2) in retrospect, the discrepancies (cued by the disruption to ongoing events) become apparent; 3) people speculate as to the reason for the discrepancies, and their speculation is plausible; 4) these speculations are made public and widely available; 5) speculations, although public, do not immediately generate widespread attention; and 6) as the public attend to the speculations, there is the potential of a threat to identity and reputation. Within this process, seven key elements are apparent: identity, retrospect, enactment, social contact, ongoing events, cues, and plausibility, each described next. In considering the elements separately, feedback loops and simultaneous processing are omitted (Weick, 1995), but this is a necessary step to understanding sensemaking theory.

2.3.1 Sensemaking is grounded in identity construction

As an individual's identity shifts, so the sense the individual makes out of a given situation will change. The meaning of a situation is dependent on the identity used by the sensemaker in making sense of it, including who the individual represents. In other words, which role and which social identity the individual prioritizes and treats as most salient when dealing with an unexpected and surprising situation affects the meaning derived. However, there is a cyclical reference here since action taken is driven by the meaning derived, and action affects how others see, and therefore treat, the individual. In turn, the individual's identity is derived in large part by how others see and treat the individual. Returning to the starting point in the cycle, identity affects the meaning taken from events in the process of sensemaking. Thus, identity and sensemaking are deeply intertwined. Weick, Sutcliffe and Obstfeld (2005) offer this variation on the earlier "how do I know what I think until I see what I say?" to demonstrate the connection: "how can I know who we are becoming until I see what they say and do with our actions?" (p. 416).

2.3.2 Sensemaking is retrospective

The creation of meaning is "an attentional process" (Weick, 1995, p. 25) focused on events that have already occurred, and is a fundamental purpose of sensemaking. The meaning derived, however, is also a function of events that have transpired subsequently and that are currently ongoing. Since individuals are usually involved in many projects and experiences, there is a plethora of possible meanings, potentially leading the sensemaker to confusion and equivocation, unable to choose the most appropriate one. Clear values, priorities, and preferences – derived

from one's individual and social identities – provide guidance on what is important to consider in meaning making. When the outcomes of events that are the subject of sensemaking are known, meaning is further guided by the human need for logical narration that privileges a determinant history. For example, if the outcome is perceived to be negative, flaws and errors are emphasized in the storytelling; the reverse is true for positive outcomes (Weick, 1995). Only in the aftermath of a decision can an act be seen to be a mistake (Weick et al., 2005). Retrospective sensemaking depends on asking the question “how can I know what we did until I see what we produced?” (Weick, 1995, p. 30).

2.3.3 Sensemaking is enactive of sensible environments

By including enactment as a key element of sensemaking, Weick (1995) draws attention to the fact that “people often produce part of the environment they face” (p. 30). By acting *in* an environment, people act *on* the environment, thus influencing and shaping it. Reciprocally, the environment shapes how the people act within it and understand events. By acting in this environment, people “create and find what they expect to find” (p. 35). Thus, in acting, people bring structures and constraints into their environment that limit their understanding of associated events. As part of this process, individuals engage in “bracketing,” whereby some element of action or the environment that is ongoing is noticed and cognitively separated (Weick et al., 2005). As a separate entity, it can attract attention and therefore be the object of meaning making and sensemaking.

2.3.4 Sensemaking is social

Identity construction, a fundamental element to sensemaking, necessarily involves others, as does the environment enacted by sensemakers. It is therefore logical that sensemaking cannot be conducted at the individual level. Even when an individual thinks or speaks an internally-directed monologue, an audience is presumed (Weick, 1995). A frequent setting of sensemaking is socialization (Louis, 1980), which cannot happen separately from a social setting. In a work environment, sensemaking is often constrained by the systemic features of the organization. The system is socially constructed and understood, and while individuals may have been socialized to the system, not everyone will participate in a shared meaning of events that occur within the system. Nevertheless, the organizational and social systems in place provide some framework that helps individuals make sense of events (Weick et al., 2005).

2.3.5 Sensemaking is ongoing

As noted earlier, individuals are usually engaged in ongoing projects. In interacting with others in the course of these projects, people are in a constant state of “thrownness” (Weick, 1995, p. 44), in which they must act on intuition, with limited information and feedback, often creating action through talk. This experience is ongoing until something interrupts it. Then, as a result of the accompanying state of awareness and arousal, people pay attention to the interrupting influence, which is usually unexpected. An emotional response is common at this point, and is frequently negative unless the interruption provides release from a stressful and ongoing situation (Weick, 1995). The interruption may have been preceded by a cue that passed

unnoticed at the time but that becomes obvious in retrospect. In this way, sensemaking is continuous and “organizes flux” (Weick et al., 2005, p. 411) from chaos into cues.

2.3.6 Sensemaking is focused on and by extracted cues

Extracted cues are “simple, familiar structures that are seeds from which people develop a larger sense of what may be occurring” (Weick, 1995, p. 50). People link a specific observation with a more general idea as part of sensemaking through cues, and the general then subsequently enhances the meaning of another particular, entering into a cycle of meaning-giving (Weick, 1995). In this process, people tie elements together cognitively and act upon the “presumed ties” (p. 54) as if they are real. Thus, through acting on specific cues, sense is actively created. The bracketing referenced earlier is part of the process of noticing and focusing on a cue, separating and labeling it, and then making cognitive associations followed by action. Weick notes that, as long as an extracted cue provokes action, “almost any point of reference will do” (p. 54) because meaning is created through action:

Once people begin to act (enactment), they generate tangible outcomes (cues) in some context (social), and this helps them discover (retrospect) what is occurring (ongoing), that needs to be explained (plausibility), and what should be done next (identity enhancement). (p. 55)

Critical to this process is that actors have faith that their cues are appropriate and meaningful. For this to happen, the cues need only be plausible, not necessarily correct.

2.3.7 Sensemaking is driven by plausibility rather than accuracy

Faced with the demand to assess a situation accurately before taking action, many individuals will be paralyzed, unable to be certain that they have understood a situation correctly. Because of the uncertainty of situations that invoke sensemaking, the “truth” of the matter may never be knowable, or at least not at the time when action must be taken. Therefore, all that is necessary to provoke action is a meaning that *could* be correct. Sensemaking “is about plausibility, pragmatics, coherence, reasonableness, creation, invention and instrumentality” (Weick, 1995, p. 57). If people can believe an explanation, they can be driven to action; from that action, sense can be made retrospectively. Thus, sensemaking involves “continued redrafting of an emerging story so that it becomes more comprehensive, incorporates more of the observed data, and is more resilient in the face of criticism” (Weick et al., 2005, p. 415).

From the above seven elements, it can be seen that sensemaking is a creative activity that spurs action, which in turn facilitates understanding and meaning making from an unexpected event. By processing experiences through one’s identity and socially enacted environment, people overlay their values and expectations on an experience, authoring their own meaning in the process (Gunn, 2008). In the case of assistant professors approaching a tenure decision, the threat of tenure denial is such an event. Although it may be anticipated near to the time, it is unexpected during the individual’s earlier career. Recognition that tenure denial may become a reality, therefore, constitutes a disruptive and unanticipated upheaval, out of which sense must be made for the individual to cope with the ramifications.

Socialized to believe that successful academics are awarded tenure, those denied tenure are likely to experience feelings of failure and thus significant professional identity threat. This

response has been conditioned by the academy in the socialization process. When one's values and expectations have been crafted by an organization or profession, it is likely that the meaning created from an event will correspond with the organizationally- or professionally-desired meaning. For this to occur, organizations or professions must expose their members to strong socialization experiences that cause the members to discard their former values and identities in favor of those that have been institutionally or professionally sanctioned and promoted. This process is termed sensebreaking and sensegiving (Ashforth et al., 2008).

2.3.8 Sensebreaking and sensegiving

Sensebreaking and sensegiving are based on the assumption that people use their identities and understanding of the world to make sense of their experiences and daily life. Sensebreaking involves the active removal of prior identities so that an organizational member needs to seek a new social identity to replace the void thus created. The void is then filled by an institutional identity (Ashforth et al., 2008), which provides the individual with a new way of making sense of the world. The institution becomes the sensegiver.

Sensebreaking “accentuates knowledge gaps” (Ashforth et al., 2008, p. 342) that motivate identity exploration, causing the individual to question what they have been, who they are now, and who they are attempting to be. This exploration is often a prelude to identity work, which will be examined in the fourth section of this review. One tactic for sensebreaking that has been recognized in identity research involves comparing the current sense of self with an ideal self, which may depend on an organizational, rather than personal, definition of ideal, as described by Michael Pratt (2000) in the case of Amway distributors.

Once an identity void has been created, an individual may be motivated to engage in seekership, which is “a sense of identity-related discontentment that results in a drive to find meaning” (Pratt, 2000, p. 469). An organization can meet seekership needs through sensegiving and socialization. Sensegiving may not be referred to as such in much of the organizational literature, but organizational communication strategies have been shown to have similar goals and outcomes in encouraging organizational identification and underscoring what it means to be a typical organizational member (Ashforth et al., 2008). Fusion of the individual identity with the organizationally sanctioned identity occurs if the emergent identity is socially validated and the sensegiving is successful.

Among Amway distributors, sensegiving involves three steps of “positive programming” (Pratt, 2000, p. 470): 1) establishing a mentoring relationship; 2) creating relationship barriers by reevaluating old relationships in terms of the organization’s values; and 3) enacting and perpetuating relationship barriers, thus hindering access to those who may not support a newly crafted identity. Another form of sensegiving is used by the British Parachute Regiment (Thornborrow & Brown, 2009). By always pushing toward a well-defined but never completed identity as a paratrooper, soldiers in the regiment felt under constant pressure to prove their paratrooper identity. In so doing, they felt that their identity was never complete – they could always act and think more like a paratrooper. As a result of their socialization, they constantly aspired to do so. This use of an aspirational identity molded soldiers’ identities into one that had been institutionally-sanctioned.

Other than these two studies (Pratt, 2000; Thornborrow & Brown, 2009), little research has been conducted on sensebreaking and sensegiving, causing leaders of this field of research to call for further work (Ashforth et al., 2008).

Both sensegiving and sensebreaking invoke sensemaking and identity work, as people involved in the process try to figure out who they are and what they could and should be. Faculty may be less susceptible to organizationally enacted sensebreaking and -giving, due to the autonomous nature of their work and the disparate cultures of different disciplines. Nevertheless, the situating of identity within a profession, discipline and/or an organization is relevant to a faculty member who faces the possible prospect of tenure denial, and who therefore lacks the identity anchor provided by the collective. The result of this situation is likely to be an exploration in identity work.

2.3.9 Summary

This section has discussed the elements and process of sensemaking, and introduced the possible organizational role in causing sensebreaking so that the organization may then engage in sensegiving. The two concepts of sensebreaking and sensegiving are a form of identity work that is commonly provoked and led by an organization. Other forms of identity work, however, may be motivated by the individual or based on social interactions, as discussed in the following section.

2.4 IDENTITY WORK

The final section of this review focuses on identity work. Following a description of identity work is an exploration of the different types thereof that are presented in the literature: professional identity formation, positive identity work, negative identity work, and finally

identity work that allows an individual to cope. Table 1 (page 46) summarizes key tactics of the different types of identity work as well as providing the main authors that describe them. Figure 2 (page 50) demonstrates how the space for identity work emerges if there are identity inconsistencies that need to be repaired by identity work.

Identity work involves crafting “a self-narrative by drawing on cultural resources as well as memories and desires to reproduce or transform [one’s] sense of self” (Alvesson et al., 2008, p. 15). It has been defined by Tony Watson (2008) thus:

The mutually constitutive process in which people strive to shape a relatively coherent and distinctive notion of personal self-identity and struggle to come to terms with and, within limits, to influence the various social identities which pertain to them in the various milieu in which they live their lives. (p. 129)

Self-consistency is an integral part of identity work (Ashforth et al., 2008), with transformation occurring if there is an inconsistency between social and personal views of the self. Indeed, consistency is so important that those with a negative self-perception may seek to confirm this negative image in the interest of maintaining self-consistency (Ashforth et al., 2008). When one’s self-narrative ceases to be perceived as authentic (as compared to prior experience and self-definition) and is not validated by others whose opinions matter, there is an impetus to restore the self-narrative, i.e., work on one’s identity (Lutgen-Sandvik, 2008). People engage in identity work when their previously stable identities are discontinued either due to changes in the setting (e.g., a new job) or the above noted inconsistencies emerge. Identity work may be triggered by uncertainty, anxiety, questioning or self-doubt (Alvesson et al., 2008).

There are few identity work studies, and most revolve around a specific population and set of circumstances. Stigmatized, low status, and bullied individuals are a common population for this research (e.g., Ashforth & Kreiner, 1999; Kaufman & Johnson, 2004; Lutgen-Sandvik,

2008; Riach & Loretto, 2009; Snow & Anderson, 1987), perhaps because identity work is helpful in maintaining a sense of self worth in the face of societal stigmatization. Another common circumstance for engaging in identity work is upon entering a new professional position, when it is deemed identity construction. Although I now focus more on the different types of identity work than connecting it to faculty worklives *per se*, both of these circumstances may be relevant to faculty. The latter is most common, of course, for new faculty members. The former may be relevant for faculty facing the threat of tenure denial. In a culture where tenure is a sought-after prize and is awarded based on the judgment of colleagues, individuals who are denied it may be socially or academically ostracized or stigmatized.

2.4.1 The identity work of constructing a professional identity

Two studies engage in determining identity work by new professionals. Herminia Ibarra (1999) studied new investment bankers and management consultants and found that they experimented with “provisional selves” (p. 764) to form their subsequent professional identity. Noting that “possible selves guide attention in sensemaking, help people select new behaviors for trial, and direct their assessments of how well they are doing” (p. 766-767), she found that new professionals fashioned their behaviors and attitudes from role models, assessed feedback about this behavior from others in the professional environment, and determined if the new identity felt authentic. Where there was low authenticity or negative feedback, refinements were made until positive feedback and authenticity were achieved.

Michael Pratt, Kevin Rockmann and Jeffrey Kaufmann (2006) studied medical residents in three different disciplines for six years, finding that when the work performed by medical residents did not match their sense of professional identity (a phenomenon they call “work-

identity integrity violation”), the residents were motivated to engage in identity work to reconstruct their professional identity. They used three types of “identity customization” (p. 246) techniques: enriching, patching, and splinting. Identity enriching was primarily engaged in by primary care residents and involved deepening the understanding of one’s professional identity. While the basic notion of one’s professional identity remained the same, these primary care residents gained a more nuanced and finely grained sense of it. Residents who engaged in identity patching had an incomplete understanding of who they were as surgeons, and these gaps needed to be patched. To do so, they borrowed elements from other professional identities that they had formed during training, either that of a “medical generalist” (p. 247) or as a doctor who had undergone rigorous training that was specific to that organization (“bootcamp”; p. 247). Identity splinting was used by radiology residents whose professional identity was only weakly defined. These residents used a well-formed, prior identity – that of medical student – to bolster and protect their “fragile” (p. 248) professional identity as a radiologist until it was more developed, at which point the student identity was cast aside.

Although not specifically termed identity work in the literature, another possible form of professional identity formation identity work involves taking a well-known role or term and altering it to fit one’s desired or perceived professional identity. This is similar to the technique of *job crafting* one’s work tasks to be consistent with one’s sense of who one is (and therefore, how one should behave) and what the job should entail (Wrzesniewski & Dutton, 2001). An example of what could be termed *role crafting* is rejection of the need to be either a “local” or a “cosmopolitan” faculty member, but declaration of being a local cosmopolitan or a cosmopolitan local (Rhoades, Kiyama, McCormick, & Quiroz, 2008). Another example, provided by Tony Watson (2008), appears to be identity work necessitated by a troublesome environment for the protagonist, a manager dealing with professional expectations for behavior that conflict with his

personal identity. At the end of his career, the manager reflects on the identity work of mediating between professional pressures and his own (and his wife's) sense of appropriate conduct.

2.4.2 Other types of identity work

In perhaps the seminal study on identity work, four types of identity work are theorized: 1) procurement or arrangement of physical settings and props; 2) cosmetic face work or the arrangement of personal appearance; 3) selective association with other individuals and groups; and 4) verbal construction and assertion of personal identities (Snow & Anderson, 1987). These types were confirmed in a study of the conflict between academic and staff identities of research administrators in the United Kingdom (Collinson, 2007). Research administrators organized their diplomas and books to show their academic interests and accomplishments (arrangement of props), maintained a professional decorum when others did not (arrangement of personal appearance), associated with academics both socially and in academic discourse (selective association with other individuals and groups), and verbally affirmed to themselves and others their academic accomplishments (verbal construction and assertion of identity).

David Snow and Leon Anderson (1987) concentrate on the fourth category in their study of homeless people in Austin, finding three main tactics: distancing, embracement, and fictive storytelling. Distancing involves articulating a distinction or separation between oneself and a group with whom society might associate them. For example, long-term homeless people distance themselves from those who routinely used the services of the Salvation Army. Embracement involves cognitive association, with an (often stigmatized) role, frequently displaying pride at the association (e.g., calling oneself a "tramp"). Articulation of friendships with others in the role and acceptance of an ideology that provides greater meaning for life were

also embracement tactics. Fictive storytelling involves narrating past, present or future accomplishments that are either clearly untrue or (for future events) that subsequently did not happen. These three categories all involve some rationalization of one's experiences and situation of identity in the world through talking.

Subsequent research on identity work has echoed three similar themes. Similar to embracement, there are a number of tactics that emphasize the positive nature of part of one's identity, privileging one element or characteristic. As with distancing, another type of identity work involves a negative reaction to parts of one's identity, either by rejecting a part thereof or separating different identities completely. Fictive storytelling could be seen as a way of reconciling one's current situation and identity; the theme of coping with the aftermath of a disrupted identity is the third type of identity work found in the literature.

2.4.3 Positive identity work

Prioritizing a favored identity is one tactic that has been reported in a number of settings. Entrepreneurial academic scientists privileged their academic identity through delegating business-related tasks to others and using these other individuals as a buffer between the business world and themselves (Jain et al., 2009). This technique can be particularly helpful when an individual has multiple professional roles of varying status. By identifying more readily with the higher status role, an individual can maintain their positive sense of self worth (Sveningsson & Alvesson, 2003). An example of this is research administrators who consciously associate themselves more with their academic colleagues than administrative staff (Collinson, 2006, 2007).

Another way of organizing multiple identities is aggregation, which has been shown on an organizational, rather than individual, level (Pratt & Foreman, 2000). This may occur after a merger or acquisition, when multiple organizational identities are forced to come together and are retained. The multiple identities may be arranged hierarchically or efforts may be made to connect identities and create synergies from which the organization can benefit. The aggregation response prevents identity conflicts and allows managers to understand which identities are most salient for different situations.

Contrary to privileging one particular identity is the integration of many different identities. This can be done consciously or not. For example, Glenn Kreiner, Elaine Hollensbe and Matthew Sheep (2006) describe a priest whose children often use his clerical title, “Father Dave,” instead of “Daddy,” and another who feels that he epitomizes the role and its ideologies in his global identity. In contrast, a third priest feels that it is just by chance that he has “hit this sweet spot of ministry where your identity and your action are kind of one” (p. 1044). On an organizational level, integration of multiple identities is conducted consciously by managers. The result may be a complete synthesis such that a new identity emerges, or a “Janusian integration” (Pratt & Foreman, 2000, p. 31) that retains but fuses two prior identities of, for example, two companies pre-merger.

Another type of positive identity work involves selectivity, both of association and disclosure. When individuals recognize that they may identify with a stigmatized group, one response is to associate with a select group who will react positively to the association rather than stigmatize the individual. In this way, people who are crafting identities that have potentially negative social ramifications seek affirmative feedback, or “positive reflected appraisals” through selective association (Kaufman & Johnson, 2004, p. 809). Similarly, priests who needed help in mediating the intensive time and identity demands of the clergy found that

involving other people helped them focus on different roles and other aspects of life (Kreiner, Hollensbe et al., 2006b). Selective disclosure was helpful to victims of workplace bullying, who found that by only portraying certain parts of themselves within the workplace they were able to attract less attention from bullies (Lutgen-Sandvik, 2008)

2.4.4 Negative identity work

A common form of identity work that is engaged in by those who experience stigmatization or “greedy” work roles is to differentiate various identities, notably the social/professional identity and the personal. This can involve distinguishing the functional from the ontological, e.g., ‘what I do’ from ‘who I am’ (Kreiner, Hollensbe et al., 2006b). Although a hierarchy is one way to integrate the identities above, it can also be used to differentiate roles, separating the most important from other demanding elements. This enables an individual to “flip the on/off switch” (Kreiner, Hollensbe et al., 2006b, p. 1044) using identity cues, as well as cognitively to set limits about what one can expect to achieve in any particular role. These tactics were all engaged in by priests seeking to improve their work-life balance (Kreiner, Hollensbe et al., 2006b).

On an organizational level, a similar technique has been called compartmentalization (Pratt & Foreman, 2000). This involves preserving all current identities without seeking to integrate or synergize between them. While this may require less effort from managers, it could also prevent the organization from acting in a coherent manner and may be confusing for employees (Pratt & Foreman, 2000). Compartmentalization exists on an individual level when applied to membership in different groups (Roccas & Brewer, 2002), as well as to roles, when it has been called “fragmentation” (Sveningsson & Alvesson, 2003). Applied to social groups, it denotes cases where people keep distinct their cognitive association with multiple groups

(Roccas & Brewer, 2002). A case of fragmentary roles is explored in a case study of one manager who has a hybrid position consisting of three main roles, for which the authors used the metaphors of janitor, ambassador, and culture creator (Sveningsson & Alvesson, 2003). These distinct roles were difficult for the manager to integrate into a coherent role through identity work, although, as the authors point out, “fragmented work does not necessary imply...a fragmented identity” (Sveningsson & Alvesson, 2003, p. 1187), so she continued to function with three disparate identities.

Another form of identity work involves repairing a negative image imposed upon oneself or onto a group by social discourse or influential individuals. Social identity theory used in relation to stigmatized occupations and groups includes the notion of social creativity. This entails stigmatized individuals finding a level, other than that commonly employed, against which to compare oneself or the group to outsiders, such that the comparison is favorable to the stigmatized group (Kreiner, Ashforth et al., 2006). For example, embalmers, stigmatized because of their association with corpses, could emphasize the artistry involved in their work, which raises their status compared to crematorium workers. Groups of stigmatized workers together “reframe” (Ashforth & Kreiner, 1999, p. 421) the meaning attached to their occupation into a more positive light and “refocus” (p. 423) attention onto nonstigmatized features of the work. Similarly, victims of workplace bullying attempt to repair their identity by attaching derogatory labels to their attackers, such as “evil,” “crazy,” “power-hungry,” and “insane” (Lutgen-Sandvik, 2008, p. 109). The tendency to “condemn their condemners and support their supporters” (Kreiner, Ashforth et al., 2006, p. 625) allows stigmatized individuals to reject negative identities and put more credence in positive outsider views, showing a clear similarity to selective association. A final type of repair engaged in by those seeking to dispel a negative image is renegotiation of meanings. Kathleen Riach and Wendy Loretto (2009) found that unemployed

older people who were unsuccessfully seeking work tried to dispel the image of unemployment by embracing a wider interpretation of what could be considered work. For example, training for a job became work, causing one study participant to self-describe as “unwaged” rather than unemployed.

The final and strongest type of negative identity work involves outright rejection of an identity. For those in a stigmatized group, this may involve “passing” as a member of the outgroup, such as if homosexuals pretend to be heterosexual due to fear of social rejection (Kaufman & Johnson, 2004). Similarly, when an identity is imposed on an individual, he or she is able to reject it by enacting an identity that is contrary to the imposed identity’s characteristics or stereotype (Riach & Loretto, 2009). Termed enacting a “negative identity,” this behavior is described as “an active, negative separation between one’s identity and something else” (Sveningsson & Alvesson, 2003, p. 1184). In some cases, rejecting or separating oneself from an imposed identity may be important for the individual to regain a positive sense of worth and self-understanding. In others, however, the individual may not doubt their identity but seek to persuade others that the identity is inappropriately imposed. In this case, the identity work has been termed “repairing,” with the remedial goals focused on altering how others perceive the situation (Lutgen-Sandvik, 2008). A weaker and more temporary type of identity work that is similar to identity rejection is “enacting ephemeral roles” (Kreiner, Hollensbe et al., 2006b, p. 1044). This tactic can be used when an individual feels that a particular identity is becoming too dominant, and involves participating in a completely different activity where the dominant identity is irrelevant, such as a priest regularly removing his or her collar to coach youth softball (Kreiner, Hollensbe et al., 2006b).

2.4.5 Coping identity work

Some cases do not allow a person to alter a situation or how one is perceived. Instead, the individual must respond by reconciling and readjusting to the new situation, which often involves making sense of it. Fictive storytelling (described earlier), is one method of coping, since the narrator fabricates a story that (s)he perceives will result in the retention of dignity and the respect of others. A similar response to a negative situation has been termed “reconciling” (Lutgen-Sandvik, 2008). This tactic is triggered when a mismatch arises between social stigma or individuals’ responses to it, and their personal identities. To remind themselves of their prior status and ongoing sense of self-worth, and also to validate that they do not deserve abuse, victims of workplace bullying engage in self-talk about their prior accomplishments, such as “if I can jump out of the sky... for the government, I’m damned well not going to be abused by some foreman” (Lutgen-Sandvik, 2008, p. 108). The same study offers identity stabilizing (accepting the negative experience and rebuilding a positive identity) and restructuring (creating anew one’s sense of self that would be acceptable after the negative experience) as mechanisms of coming to terms with the trauma of bullying and the notion of an unfair world, and, more important, the subsequent rebuilding of identity narratives. Through a grieving process, victims in this study were able to process the disruption to their ontological security, the destruction of their identity, and their perceived loss of professional reputation. Alongside this process was a common process of sensemaking. Since bullying is unexpected in the workplace, victims felt the need to confirm their perceptions, identify the causes, and take action to remedy them before attempting to validate the self in the face of the trauma.

Table 1 summarizes key identity work tactics and authors, as well as sensebreaking and sensegiving. The latter two are included because they have elements similar to identity work,

Table 1: Key tactics and authors of identity work

Identity Work	Key Tactics	Key Authors
Sensebreaking	<ul style="list-style-type: none"> • Break or remove prior values and identities to create an identity void • Compare current self with an ideal self • Limit contact with those beyond organizationally-sanctioned identities 	Ashforth, Harrison, & Corley, 2008 Pratt, 2000
Sensegiving	<ul style="list-style-type: none"> • Provide a ready-made identity or set of values • Fill the void created by sense-breaking 	Pratt, 2000 Thornborrow & Brown, 2009
Professional identity construction	<ul style="list-style-type: none"> • Test provisional selves for authenticity • Enrich identity by gaining a more finely nuanced understanding of self-in-role • Patch identity with elements borrowed from other roles • Splint identity to bolster a fragile identity until it is formally formed • Craft one's perception of role or job to make it fit better with one's sense of self 	Ibarra, 1999 Pratt, Rockmann, & Kaufmann, 2006 Watson, 2008 Wrzesniewski & Dutton, 2001
Positive identity work	<ul style="list-style-type: none"> • Prioritize a favored (positively viewed) identity • Aggregate multiple identities (into a hierarchy) • Integrate multiple identities to the point where a hierarchy is not necessary • Selectively associate with those who positively view one particular identity 	Collinson, 2007 Jain, George, & Maltarich, 2009 Kaufman & Johnson, 2004 Kreiner, Hollensbe, & Sheep, 2006b Lutgen-Sandvik, 2008 Pratt & Foreman, 2000 Sveningsson & Alvesson, 2003
Negative identity work	<ul style="list-style-type: none"> • Differentiate between various identities (disentangle self from role) • Compartmentalize • Disidentify with a role or particular identity component • Repair a socially-imposed negative image by comparing self to others who will be <i>more</i> negatively viewed 	Ashforth & Kreiner, 1999 Kaufman & Johnson, 2004 Kreiner, Ashforth, & Sluss, 2006 Kreiner, Hollensbe, & Sheep, 2006b Lutgen-Sandvik, 2008 Pratt & Foreman, 2000 Roccas & Brewer, 2002 Riach & Loretto, 2009 Sveningsson & Alvesson, 2003
Coping identity work	<ul style="list-style-type: none"> • Reconcile self to new situation • Positive self-talk • Take time to process events and re-stabilize identity 	Lutgen-Sandvik, 2008 Snow & Anderson, 1987

albeit on more of an organizational level.) This section has described the different types of identity work found in the literature. The next section addresses how the concept of identity work is relevant to the problem and research questions identified in chapter one.

2.5 CONCEPTUAL FRAMEWORK

Identity, and particularly professional identity, is strongly related to the roles and social groups with which one associates. Personal, social, and professional identities merge to create a self-in-role enactment. This enactment is subject to organizational discourses, personal narratives and social expectations. If there is dissonance among any of these, or if an unexpected interruption to the narrative occurs, individuals are likely to engage in some form of sensemaking or identity work. These two activities overlap significantly; each entails creating certainty out of a situation and understanding how one is situated within it. A coherent, authentic sense of self aides the sensemaking process, which is useful for spurring action out of a surprising experience that would otherwise cause paralysis through indecision. Identity work serves to reshape a coherent understanding of one's personal, social or professional identities, or a combination thereof. It can involve emphasizing positive elements of different identities, rejecting socially imposed negative elements, or reconciling to a new situation and perceived identity.

As noted earlier, my primary research question is “how do pre-tenure biomedical faculty in a top research university cope with the threat of tenure denial that is due, in part, to the current NIH economy?” The literature examined here speaks to both psychological and behavioral elements of coping. The rationale for using this literature is best demonstrated by three questions that faculty facing tenure denial may ask:

- 1) If I am not a research scientist [because I do not have the requisite funding], what/who am I?
- 2) Does [or can] that fit with my perception of myself?
- 3) What should I do now?

The first question relates to professional identity. The multi-leveled nature of identity and how professional identity is intertwined with other aspects of identity theory is apparent in the identity literature. Professional identity, and therefore how one reacts to specific work-related events, is a function of the various facets of identity that are both innate and shaped by societal forces. The literature on organizational socialization, (Van Maanen & Schein, 1979), graduate student socialization to academia (Austin & McDaniels, 2006; Bragg, 1976; Gardner & Barnes, 2007; Weidman & Stein, 2003; Weidman et al., 2001), and organizational socialization within academia (Reynolds, 1992; Tierney, 1997; Tierney & Rhoads, 1993) sheds light on the formation of a professional and social (i.e., organizationally-related) identity within the academic context. However, these bodies of literature do not speak to the fundamental questioning of self, career, and institutional choice that may be involved in identity work when one's professional position is significantly threatened. For this, and for subsequent understanding of identity work, the organizational literature on identity is more appropriate.

Identity work and the process of identity (re)construction is relatively new; only a handful of studies have investigated the phenomenon. Its elements of focus – maintaining self-consistency, reconciling socially-imposed stigma or a negative association with an individual's self-perception, and maintaining a positive self-image – are critical for faculty who face the threat of potential tenure denial. Such faculty may be stigmatized by administrators and colleagues, and they may have to consider that their assumed career path of over a decade will no longer be viable. They may ask themselves the second question above: whether another career or

other people's perceptions of them could match how they view themselves. Psychological coping mechanisms and consideration of whether the newly considered professional identity could be viable are plausible outcomes. In this study, I examine these and other forms of coping, viewed in the framework of identity work.

As noted earlier, understanding identity helps one to appreciate the nature of sensemaking. Socialization, which affects identity, influences how an individual makes sense of an experience. For example, if during the postdoctoral years a scientist learns from a mentor how to behave in, and make sense of, specific situations (such as having a manuscript rejected), the scientist is likely to replicate this behavior and sensemaking, when appropriate, later in his or her career. Thus, while identity and sensemaking are intricately linked, the identity literature addresses psychological coping but the sensemaking literature prioritizes the subsequent action or behavior that allows a faculty member to cope. Answers to the third question, "what do I do now?" may be provided by sensemaking, due to its action orientation. The sensemaking literature provides an understanding of how people derive meaning from unusual events and subsequently decide upon appropriate action. In this way, it becomes a part of behavioral coping in unexpected circumstances. Although related literature, such as that on grieving (e.g., Kübler-Ross & Kessler, 2005) and anxiety (e.g., Weinberger, Schwartz, & Davidson, 1979) provides coping mechanisms and models for people who may mourn the potential loss of their career and are anxious about their future, they do not drive action *per se*. It is for this reason that sensemaking is the most appropriate theoretical framework for this aspect of the study.

I conducted a pilot study (Robinson, 2009), in which I observed common themes and sensemaking narratives among senior faculty who had experienced funding loss. The framework from that study has been refined here to focus more extensively on sensemaking and identity

work. That study and the identity work literature suggest how identity work might be stimulated in a research-intensive, academic biomedical research environment.

2.5.1 Space for identity work

In an ideal situation, an individual's global identity, roles and organizational cultures function coherently and consistently. However, if there is an imperfect fit, or even a chasm, between any of these elements, space for identity work emerges (figure 2). Identity work acts in the space created by a mismatch between the key elements affecting an individual's professional identity to anchor the fractured identity components and ultimately bring them back together. Thus, the identity work repairs and rejoins these elements of an individual's identity to maintain self coherency and consistency.

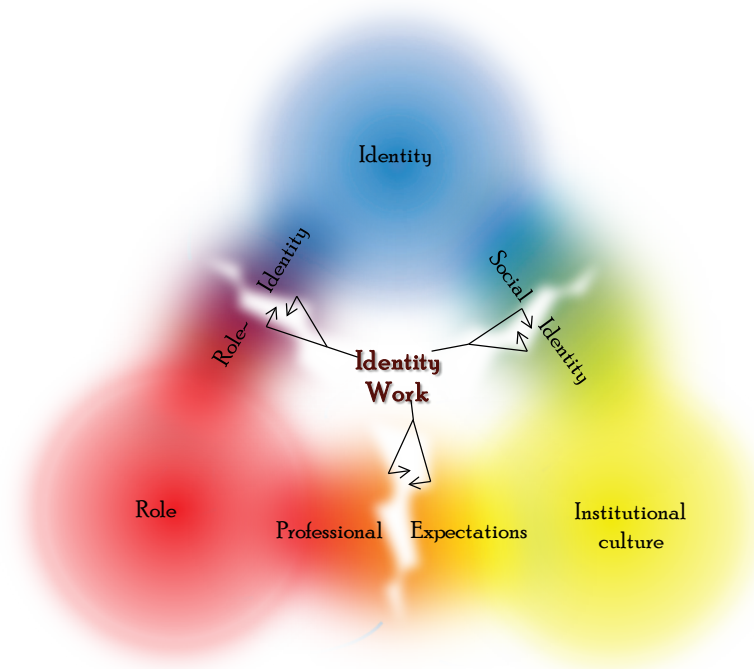


Figure 2: Space for identity work

The individual's global identity (blue in figure 2), the role of being a biomedical scientist at an elite research university (red) and the institutional culture, including the funding climate (yellow), are major concepts that are relevant to these faculty members' professional identities. At the overlap of each of these identity-related concepts are nexus components that also influence professional identity: social identity, role-identity, and professional expectations. In figure 2, these nexus components are fragmented to symbolize a mismatch or imperfect fit between the two adjoining concepts.

Between the role and the identity is the enactment of the role by the individual, or the role-identity. If there is a mismatch or fracture in the role identity (as in figure 2), the individual may need to engage in identity work to reconcile the two (arrowheads). For example, if a faculty member believes 'a good biomedical scientist at this institution is focused first and foremost on their research,' but simultaneously says "I really love classroom teaching," there is a tension that needs to be resolved.

Choices available to the individual in this situation include: 1) changing the individual's notion of what constitutes a good biomedical scientist at this institution (role crafting); 2) disidentifying with being a good biomedical scientist at this institution (negative identity work); 3) publicly prioritizing research (positive identity work) while privately acknowledging that (s)he is subsuming his or her love of teaching (coping identity work); 4) promoting the importance of teaching in an educational institution (positive identity work); 5) learning to live with the imbalance in their main interest and what they have to do (coping identity work). Successful identity work in this area will result in the closing or lessening of the gap created by "work-integrity violations" discussed by Pratt and colleagues (2006). In essence, any of the tactics above may become the thread that sews the individual's identity back together.

The individual's global identity (blue in figure 2) influences his or her sense of fit within the institution (yellow) and how (s)he is viewed by others. Included in the institutional environment is the funding climate, as changes in it are likely to be replicated within the institution. Social identity theory speaks to the sense of belonging, as well as perception of self by others, and thus is relevant in the nexus between institution and identity. If there is a mismatch between the individual's behavior, values, or beliefs, and what is organizationally sanctioned, the individual may be prompted to conduct identity work. For example, if the institution espouses the incessant pursuit of NIH funding, but the individual is content with just one NIH grant, there is a mismatch.

These two elements can be realigned through identity work as follows: 1) highlighting the importance of the research conducted on their grant, and success they have had with this work (positive identity work); 2) integrating multiple scholarly identities within the organizational context, such as mentor, teacher, institutional citizen as well as researcher, that fill the void created by institutional pressure to secure funding (positive identity work); 3) opening oneself to organizational sensegiving, allowing oneself to be pushed towards an ever-increasing funding goal that is never to be fulfilled (sensebreaking and -giving); 4) differentiating between the global and professional identities, effectively appreciating that although the faculty member may not meet the institution's definition of successful scientist (s)he can still be a good spouse, parent or person (negative identity work); 5) choosing not to live with the stigma or institutional pressures, and instead looking for an institution that values a scientist with one grant (coping identity work). Successful identity work results in organizational fit.

The faculty member's understanding of role (red) – what it means to be a biomedical scientist – is influenced by the institution in which he or she works, as well as by the culture of the profession (yellow). Therefore the nexus between the two is the enactment of professional

expectations. The individual's identity is weakest here, as it reflects institutional and professional pressures rather than how the individual negotiates them. A mismatch here is less likely to prompt identity work, but if an individual's understanding of the role does not fit with that of the institution, there may be an influence on the person's role-identity and sense of fit.

In addition to highlighting the space for, and somewhat nebulous form of, identity work, figure 2 is intended to demonstrate the overlapping nature of the various elements of identity. These elements, if disrupted by a change in the environment or unexpected pressures, may create a dissonance that needs to be reharmonized through identity work.

There are few models of identity work, and few authors have tried to draw together the various studies. In reviewing the identity work literature, there are specific suggestions for further research in this area. Blake Ashforth, Spencer Harrison, and Kevin Corley (2008) in their recent, comprehensive review of organizational identification call for further investigation into sensebreaking and sensegiving, as well as how "career identities are retrospectively and prospectively constructed" (p. 351). Professional identity threat or deconstruction processes also need further study, particularly with regards to perceived downward career transitions (Sargent, 2003).

To this end, further research in other contexts must be conducted so that a comprehensive understanding of identity work can be gained. By conducting a study of pre-tenure biomedical researchers, I intended to add another highly contextualized study to the identity work literature. Only two of the studies reviewed above were conducted in an academic context (Jain et al., 2009; Pratt et al., 2006), only one of which (Jain et al., 2009) focused on faculty. In summary, the processes involved in professional identity construction and reaction to identity threat are poorly understood and require further theoretical work; this study adds a piece to the puzzle surrounding professional identity construction and threat.

3.0 METHODS AND RESEARCH PARTICIPANTS

This study is concerned with how biomedical faculty experience a specific, highly contextualized situation. Qualitative methods are most appropriate for answering my research questions, since qualitative researchers “strive to *understand the meaning* people have constructed about their world and their experiences” (Merriam, 2002, pp. 4-5, italics in original). In so doing, the qualitative researcher interprets the world around them and draws conclusions from the data gathered. This involves making sense out of experiences and data, which is both “artful and political” (Denzin & Lincoln, 1998, p. 30) since there are usually multiple possible interpretations. My own experiences and situation as researcher therefore become relevant in this study, even though the data consist of the narratives of others.

As Denzin and Lincoln (1998) note, there are many genres and methodologies of qualitative research. It is therefore more appropriate to discuss the use of narrative, as one particular qualitative approach, rather than using the umbrella term of qualitative research.

3.1 NARRATIVE

Narrative research data consist of stories detailing the narrators’ experiences of lived events (Merriam, 2002). Clandinin and Connelly (1998) distinguish between narrative (the method of inquiry) and stories (the phenomenon); I follow their distinction in this text. People understand,

explain, and make sense of their lives and the world about them through stories (Connelly & Clandinin, 1990; Hones, 1998; Richardson, 1990), which make public the meaning constructed from experience (McCormack, 2000). This meaning construction is rooted temporally, in that events are ordered into a sequence by the narrator, both inwardly and outwardly, i.e., what it means on a personal level to the individual, and on a social level in terms of an existing external environment (Clandinin & Connelly, 1998). The inclusion of the narrator in the events, and the expression of the narrator's emotions, interpretations, and opinions set narrative apart from policy, chronological accounts, and scientific discourse (Chase, 2005).

The ways in which people use stories to produce meaning have been explored by Laurel Richardson (1990), who notes that people provide a link between events in their stories. The relationship between events, subsequent actions, and emotions described by the narrator are pertinent to making the ascribed meaning visible, and provide a means to understand how sense was made. Time and sequencing are of primary importance, says Richardson:

The meaning of each event is produced by its temporal position and its role in a comprehensible whole. Narratively, to answer the question, 'what does something mean?' requires showing how the 'something' contributed to the conclusion of the episode. The connections between the events constitute meaning. (p. 118)

In the context of a research interview, the interviewer tries to elicit not just the sequence of the events discussed but also the connections made by the narrator that have helped constitute a meaning associated with the experience. In this way, narrative research interviews provide a specific context for the telling of a story. The story is being told because the researcher has expressed an interest in hearing about specific experiences and events. The telling of the same experiences and events to a family member, colleague, or member of the media is likely to differ. Thus, stories are shaped by interaction with the audience, and are a co-construction between the

narrator and the researcher (Chase, 2005). The subsequent interpretation and presentation of stories in narrative research further involve the researcher as co-constructor of meaning. Given the latitude for interpretation, it was important for me to conduct this study in a culture and setting with which I was familiar, and therefore better situated to infer and co-construct meaning.

The two focal points of this study are sensemaking and issues of identity. In the next two sub-sections I show how the language of narrative entwines with both of these, making it a natural methodological choice.

3.1.1 Narrative and identity

As noted in the literature review, identity is the foundation for the meaning given to an experience. Also as noted above, stories provide a means for expressing that meaning, and narrative inquiry is a way in which researchers can access people's meaning making from experiences. The construction of meaning and identity through speech has been studied by philosophers studying hermeneutics, such as Martin Heidegger, Hans-Georg Gadamer, and Paul Ricoeur (see Herda, 1999 for a detailed coverage of the emergence of hermeneutics). The hermeneutic philosophy, particularly the importance of narrative in meaning construction and identity, has informed my approach for this study.

Stories are integral to identity construction; the stories people tell both reflect and become part of them. They are "one of the inescapable structural requirements of identity" (Mathieson & Henderikus, 1995, p. 288). Stories are constructed and reconstructed to fit with a coherent sense of self – one's ongoing but ever-changing identity (Richardson, 1990). Events are reorganized until a structure or plot emerges that appears both plausible and meaningful to the narrator (Ezzy, 1998). The authoring of coherent self-narratives allows the individual to satisfy

the intrinsic need for self-knowledge, -esteem, and -continuity (Clarke, Brown, & Hailey, 2009). This self-coherence, one of the goals of identity work, is created through the weaving of stories based on one's notion of self and the surrounding world.

Tony Watson (2009) links narrative, identity, and the social construction of reality, noting that narratives are based on both a personal identity and a social identity through a socially constructed narrative:

We all have narratives “in our heads,” so to speak, and there are narratives all around us “out there” in the socially constructed realities of our societies. Human beings both make narratives and engage with those which are discursively available to/imposed upon them. (p. 427)

For this reason, I sought the stories of researchers in a very specific context. It was important that all the participants have a similar social narrative available to them by virtue of being in the same school within a single institution, and sharing a similar set of professional duties – research, service and teaching. As such, they are subject to similar institutional pressures and a shared culture. Differences that emerged would therefore be a function of the people with whom they interact the most or a result of their own identity narratives. It was therefore most appropriate to investigate the identity work engaged in by these faculty by undertaking a narrative study.

3.1.2 Narrative and sensemaking

Telling stories, as “retrospective meaning making – the shaping or ordering of past experiences” (Chase, 2005, p. 656), closely resembles the activity of sensemaking. Both are retrospective, founded on plausibility, social, based on cues that bracket something off from the ongoing flow

of events, involve some sort of action, and are ongoing. The central question in sensemaking noted earlier, “how do I know what I think until I see what I say?” (Weick, 1995, p. 18), epitomizes the centrality of speech in sensemaking. The narrative interview, therefore, is an ideal opportunity to record episodes of sensemaking, either those that have already occurred, or those that occur during the interview as the participant is encouraged to reflect upon experiences and subsequent events.

Richardson (1990) argues that the analysis and presentation of this sensemaking with regards to a specific context can be of societal benefit because “social interaction depends on actors making sense of others’ actions and motivations from the point of view of the others” (p. 127). Therefore, not only is narrative the natural way to explore sensemaking, it may provide to others with similar stories a framework for their own sensemaking. The creation of this collective story not only allows general connections to theory to be drawn, but also “overcomes some of the isolation and alienation of contemporary life” (Richardson, 1990, p. 129). In the context of faculty who may be shunned by their department and/or colleagues for failing to secure federal research support, I consider such reassurance of a collective narrative to be a positive outcome of this study.

3.2 DATA COLLECTION

I obtained permission from the University of Pittsburgh Institutional Review Board to conduct this study (PRO09090465).

3.2.1 Identifying participants

I sought tenure track assistant professors with PhD degrees in two groups: those whose administrators consider them to be relatively uncompetitively placed with regards to tenure by virtue of their funding levels, and those who have substantial funding as they approach the tenure decision. The lower-funded group included faculty with one or no R01, or who covered less than 75% of their salary on grants. If they had an R01, it was due to expire prior to their tenure decisions and they would not have successfully renewed it at the time of interviews. The higher-funded group included faculty with two or more R01s, or one substantial NIH grant and additional funding from a foundation or health association.

In the school of medicine in which this study was conducted, departmental promotion and tenure committees decide during the fifth year of the tenure track whether to nominate assistant professors for tenure (which occurs during the sixth year), remove them temporarily from the tenure stream (“type A removal”), or remove them permanently from the tenure stream (“type B removal”). The former allows assistant professors two extra years in which to build their tenure portfolio; the latter forces faculty to find other employment, although there was no strict “up or out” policy at this medical school. Based on this timeline, I sought faculty participants with three or more years in the tenure stream, as they would be within two years of their departmental decision regarding tenure nomination.

I focused on PhD assistant professors because they do not have the ability to bring in income to the division or department through clinical work, depending instead on grants for research income and salary support. The faculty had to be close to the departmental tenure decision so that the emotions surrounding potential tenure denial were already being experienced, if at all. Faculty with reduced funding levels were ideal participants because they

might have believed that a tenure decision would not necessarily be in their favor. Although this is an uncomfortable position, it is precisely in this situation that I theorized that professional identity threat might be felt, and identity work and sensemaking would be most acute.

I sent an email to division and department administrators within the medical school where I conducted this study. The email explained the intent and purpose of the study, and asked them to consider if any of their faculty fit into one of two groups: 1) those who may be uncompetitively placed with regards to tenure, based on their level of funding, and who are within 24 months of the department tenure decision (including those who were currently in the middle of the tenure process); 2) those who have an unusually high level of funding as they approach the tenure decision. I asked administrators to approach any relevant faculty member about the possibility of participating in my study. I followed up my emails to administrators with telephone calls, asking them to give my request some thought. Administrators who had suitable faculty gave them my contact details, and the faculty who were willing to be interviewed contacted me. I also contacted a small number of senior faculty in leadership positions whom I knew professionally to ask if they were aware of junior colleagues who might be suitable participants. I sent them the same email that the administrators had received.

Administrators are well-placed to identify faculty who may have insufficient funding for a strong tenure bid because they manage division or department finances, work with faculty to apply for grants, and have experience helping faculty through the tenure decision. Administrators therefore are aware of which faculty have substantial funding. This communication and selection method also avoided the need for me to have access to a large number of faculty members' personal funding situations and allowed faculty who were approached to self-select for participation, thereby avoiding the potential for them to feel coerced to participate. Like administrators, senior faculty are also frequently aware of their junior colleagues' funding

situations. However, their relationship with junior faculty differs from that of administrators, being mentors and colleagues and not having to cross the faculty-staff cultural divide. As faculty leaders, they are better positioned to persuade junior faculty that participation in this study could help others in similar situations.

There was a relatively small number of suitable faculty in the lower-funded group within the School of Medicine, and I anticipated that only a portion of those would be willing to speak with me. In the original study design I hoped to interview at least eight higher- and eight lower-funded assistant professors, in the belief that this number would capture a range of views and experience. When I was nearing the total of sixteen participants I had originally hoped to interview, I continued to seek additional faculty to participate, since more stories would add to the variety and richness of the data set. I continued seeking participants until no further faculty contacted me, ending with ten lower-funded and eight higher-funded.

The reliance on participants' willingness to be interviewed and engage in truthful discussions about their experiences is a limitation of this study. The self-selecting nature of the participant group means that their stories and experiences may not be representative of other faculty in the same institution. They also may have presented their experiences in a way that portrays them in a particular manner, which might not mesh with how others perceive them. To accommodate this limitation, I respected the idea throughout the study that, as researcher, I report faculty perceptions and sensemaking rather than empirical truths. Ultimately, whether something is a perception or a truth might be irrelevant to the effect it has on one's identity and the sense an individual makes of experiences.

Due to the faculty demography at the medical school in which the study was conducted, it was likely that a number of participants would not be native English speakers. I anticipated that since this methodology relies on clearly hearing and understanding their stories, heavily accented

English or grammatical errors could lead to transcription or interpretation inaccuracies. To minimize the effect of this potential limitation, I sought clarification during interviews, transcribed all the data carefully, and asked participants to verify the accuracy of my findings with regards to their contributions to the study.

All the participants in this study had to be pre-tenure decision, by the nature of the study design. This is a limiting factor in that some faculty might only be forced to undergo some form of sensemaking or identity work after a surprising negative tenure decision. Therefore, it was possible that I did not interview them at the appropriate time. I attempted to overcome this limitation by speaking to enough faculty to capture a wide range of experiences, levels of funding, and stages in the later tenure process.

Another limitation is that I conducted this study at a single institution. I did this purposefully so that all participants operated in a shared culture, with which I am also intimately familiar, having worked in it for four years. The institution emphasizes NIH funding and has strong ties with an notable hospital system. The findings from this study may be relevant to other institutions in a similar setting. Nevertheless, this factor becomes a limitation in that the findings may not be relevant for all medical schools.

3.3 PARTICIPANTS

Eighteen faculty members responded to colleagues' or administrators' requests for interviews, which I conducted over an eight week period. Thirteen interviews were in faculty offices; three in a conference room to which I had access because the faculty members' offices were a considerable distance away; two in conference rooms near the faculty members' offices.

There were ten men and eight women. The medical school faculty is approximately 40% female, meaning that women were slightly over-represented in this group of participants. Eight faculty had R01 grants that would continue through their funding decision, or covered more than 75% of their salaries on grants. These faculty constitute the “higher-funded” group. Ten faculty had no R01 grants on which they were the PI, covered less than 75% of their salary on grants, or were PIs on R01s that would expire before the tenure decision. These faculty constitute the “lower-funded” group. It is important to note that in using the terminology *higher- and lower-funded*, I do not pass judgment on participants’ abilities, likelihood for tenure, likelihood for future funding, or on any other dimension. Although these nomenclatures may be deemed insensitive, this is not their intent; I use them only as a way of delimiting the two groups in terms of current funding levels. I distinguish between these groups because those with differing funding amounts may have different experiences and stances of my interview questions.

Ten faculty were in clinical departments and eight were in basic science departments. One of these eight had recently moved from a clinical department. Eleven departments within the School of Medicine were represented: six clinical and five basic science. Participants came from twelve different countries on four continents, with more than one faculty member being from each of Canada, China, and the United States. The participants, their funding status and type of department are listed in table 2.

Table 2: Profile of participants

	Funding Status		Department Type	
	Higher	Lower	Basic Science	Clinical
Adam	X			X
Beatrice	X		X	
Charles		X		X
Daniel		X	X	
Francis		X		X
Hermione	X			X
Isobel	X			X
Jonathan		X		X
Karen		X		X
Luke		X		X
Matthew	X		X	
Nicola	X		X	
Oliver	X		X	
Peter		X		X
Rebecca		X	X	
Sally		X	X	
Terry	X		X	
Victoria		X		X

Of the eighteen participants, twelve had taken a direct educational path from their undergraduate degree through graduate school into academic research, most via a postdoctoral training period but two directly into a faculty position. Three of these and one other had anticipated at the start of their undergraduate degree that they would end up performing clinical work. The one participant who did not take a direct route into academic research spent some time working with patients before realizing that research would be more personally fulfilling. The other six participants had taken indirect paths into academic science. One went to military medical school in his/her mid-teens because the military uniform was appealing. The major subject of study for this participant was of less concern at the time than attending the military medical school. Another entered scientific training as a legitimate way to avoid military service, and found an unknown natural talent for it. Another participant grew up surrounded by scientists but dropped out of school and did little for several years. When (s)he decided that it was time to become a productive member of society again, the only career path of any familiarity was academic science. The remaining three participants had undergraduate degrees in different disciplines. Two were tangentially related to their current area of focus, one was not. The faculty member whose area of study was not related to his/her current work had a chance encounter with a scientist who persuaded this individual to enter graduate school in the sciences.

Five faculty members were at the start of their fourth year; two had tenure portfolios moving through the tenure committees at the departmental or school level. The other eleven were in between these ends of the spectrum. One was in the middle of a temporary removal from the tenure stream, two more were being advised that this would be a prudent step, and one had been permanently removed from the tenure stream but was seeking to be reinstated due to recent notable success in producing prominent publications and being awarded grants.

In summary, the participants represented a broad range of experiences based on departmental affiliation, field of study, background, time at the institution and funding success.

3.3.1 Conversation-interviews

Having given interested faculty information about the study by email or the telephone, I arranged an interview either in their office or a conference room to which I had access. I asked them to allow ninety minutes for the interview and also sought their permission to record the interview. At the start of each interview, I obtained verbal consent to conduct the study from the interviewee, introduced the topics I wished to cover, and used a semi-structured interview-conversation format, moving systematically through pre-determined interview questions (Appendix 1).

Although I used a list of seventeen research questions, I drew from the work of Elliott Mishler (1986), adopting the concept of an interview-conversation, where the interviewee can maintain power to introduce themes and topics as they desire. This approach was intended to lead to richer data than a fully-structured interview, where the interviewer may not be aware of all relevant topics. During the interviews I gave participants as much time as they needed to answer questions. I prompted them with questions such as “How did that make you feel,” and “What happened next?” until they had exhausted a topic. In cases where participants introduced topics about which I had planned to question them later in the interview, I allowed them to pursue the subject, using that opportunity to cover the theme in depth before returning to any questions we had skipped. When, subsequently, I arrived at a question that related to the topic that had already introduced and discussed at length, I asked if they had anything else to add.

In this manner, I allowed the participants to guide the conversation as much as possible, while still ensuring that all my interview questions were asked and discussed in detail. For brevity's sake, I use the term 'interview' to denote this notion of an interview-conversation that is on the lesser-structured side of semi-structured.

3.4 INTERVIEW QUESTIONS

The overarching research question of this study is, *how do pre-tenure in a top research university cope with the threat of tenure denial that is due, in part, to the current NIH economy?*

To answer this broad question, I proposed four sub-questions:

- 1) How do these faculty make sense of the threat of tenure denial and their funding experience?
- 2) How does this experience shape the faculty members' professional identities?
- 3) In what types of identity work do these faculty engage?
- 4) What aspects of the institutional experience are related to participants' sensemaking and professional identities?

The questions that I used to guide the interview are listed in Appendix 1. There are three main areas I wished to cover: what it means to the individual to be a scientist, their funding experiences, and the role of the institution in the experiences they narrate.

I did not use the language of identity work during the interviews because without an understanding of the concept, it could have been difficult for faculty to speak of identity work. Instead, by addressing the three major and three nexus identity components depicted in Figure 2, I hoped to elicit conversations that moved us towards the identity work space. For example, by

asking the faculty to speak about how they saw themselves, their role and their fit, the pressures they feel, and changes in the funding environment, I aimed to create a space in which description of any previous or current identity work may emerge. For this reason, it is not possible to equate interview questions with single research questions. Rather, I approached the left- and right-hand sides of figure 2 in two separate sets of questions (left = interview questions 1-6; right = interview questions 7-11) in an attempt to gather rich data that broached the subjects of identity (re)construction and meaning making (research questions 1-3) from a variety of angles.

Fundamental to the first three research questions is how the faculty members understood their professional identities. I approached this topic by asking about their global identities and how those mesh with what it means to them to be scientists. I anticipated that an understanding of professional identity would be integral to the sense that these faculty members would make of their funding experiences and of facing potential tenure denial, since identity influences sensemaking. Their professional identity construction and re-construction (through identity work) is the focus of research questions 2 and 3. Therefore, the first three research questions are conceptually highly integrated.

The first set of questions are based on an interview protocol used by Kreiner, Hollensbe, and Sheep (2006b), where the researchers used these and other questions to explore identity work among priests. These questions help to establish the participants' understandings of their identity and role, the pressures they feel with regards to their role-identity, how they were socialized into academic science, and how the changing funding and institutional climates may have influenced these understandings. Because the concepts overlap and may not be appropriately addressed in interviews, each of the questions regarding being a scientist contributes to more than one research question. Table 3 shows how the interview questions fit into the theoretical framework, and therefore how they help answer the research questions.

Table 3: Relationship of research and interview questions with elements of identity and identity work

Interview Question	Element of Identity or Identity Work	Research Question
1	Identity construction	2; also contributes to 1 and 3
2	Understanding of role	1; also contributes to 2 and 3
3	Understanding of role-identity	1 and 2
4	Process of identity work	3; also contributes to 1, and 2
5	Professional identity construction	2; also contributes to 1 and 3
6	Reactions to potential environmental and role pressures that may prompt identity work	3; also contributes to 1, and 2

Table 4: Relationship of research and interview questions with elements of identity work and tenure threat

Interview Question	Element of Identity Work or Sense of Tenure Threat	Research Question
7	Funding history	1
8	Strength of tenure denial threat	1
9	Understanding of professional expectations	2
10	Tenure threat experiences and reactions	1 and 3
11	Nature of identity work, biased towards coping identity work	3

The second set of questions in the interview addresses the right-hand side of figure 2: how the global identity fits with institutional culture and pressures, and how the institutional and funding environments influence what it means to be a successful biomedical scientist. Table 4 shows how the interview and research questions align with environmental factors. These questions were designed to allow the participants to situate themselves and their views within the funding context outlined in the problem statement. Once situated, these questions were intended to lead participants into the identity work space if they had ever felt any threat to their tenure decision from the funding environment.

Questions 7 and 8 provide background information regarding the participants' perceptions of their funding history and future prospects. This allowed me to determine how strongly they sensed a tenure threat, and thus the strength of motivation for identity work. The more worried an individual is about tenure denial, the more benefit can be found from sensemaking to provide a meaningful explanation for the current circumstances. Additionally, the anxiety and concern over their future professional positions might prompt faculty to embark on identity work to determine what they would do if they were not awarded tenure.

Question 9 relates to professional expectations within the institutional context, as it questions faculty members' perception of the relationship between funding and tenure. Faculty professional identities are shaped within these professional and institutional norms. Therefore, this question addresses professional identity formation within the faculty member's current institution.

Once the participants' funding contexts were established, questions 10 and 11 encouraged them to speak about any anxiety and changes in identity they may have experienced when facing the threat of tenure denial. Question 10 invited the faculty member to share how they made sense and meaning out of the experience, with probe 10d leading into question 11, which explores

possible alternative identities. By encouraging participants to discuss other career paths and how this would affect their perceptions of themselves as scientists, I hoped to move the discussion into the identity work space. Because I asked about coping and alternative careers (which may be most appealing if the threat of tenure denial is strongly felt), this question is biased towards coping identity work, but I anticipated that answers would cover a range of identity work.

The third set of questions focuses on how the institutional culture and personnel contributed to the threat of tenure denial and subsequently helped or hindered the faculty member in coping with it. This set of interview questions was intended to help me answer the fourth research question, as shown in Table 5.

Question 16 invites participants to add any other information that they feel to be relevant. Because I used a semi-structured interview format, I hoped that the participants would feel comfortable adding such information throughout, leading the conversation as much as possible. Only when they had exhausted one topic did I progress to the next question.

Table 5: Relationship of research and interview questions with institutional role in the experience of tenure threat

Interview Question	Element of Identity Work or Sense of Tenure Threat	Research Question
12	Institutional pressures that create sense of tenure threat	4
13	Personnel who helped faculty cope	4
14	Actions that hindered coping	4
15	Suggestions for more helpful institutional role	4

The final question was included in case I had difficulty finding faculty to be interviewed. If the faculty member knew of an appropriate colleague, I asked that they approach him or her with regards to study participation.

Following each interview, I assigned each participant a sex-appropriate pseudonym, chosen to have no similarity to the participants' real names. I ensured that each pseudonym began with a different letter so that in the transcripts I could use the pseudonym's first initial only and did not want to confuse participants when reading transcripts. I transcribed the data verbatim, including stutters, grammatical errors, and an indication of long or short pauses to convey textually the tone and nature of the speech. For transcription, coding, and subsequent analysis, I used NVivo8 software. Section 3.4 provides an explanation of how Computer Assisted Qualitative Data Analysis Software (CAQDAS) facilitates the research process.

3.5 COMPUTER ASSISTED QUALITATIVE DATA ANALYSIS SOFTWARE

Computers can help the researcher create “theory from data” (T. Richards & Richards, 1991, p. 308) by facilitating the process (Kelle, 2000) but they do not create theories themselves (Bringer, Johnston, & Brackenridge, 2004; Weitzman, 1999) or even provide an analytical structure (Pope, Ziebland, & Mays, 2000). Thus, as with manual methodologies, the researcher remains integral to data analysis and theory construction, and responsible for the rigor of the methodological approach (Weitzman, 1999). While using computers can help the researcher add rigor by facilitating a more complex analysis, the use of computers *per se* does not automatically add rigor.

Compared to manual administrative data management (e.g., photocopying, highlighting, cutting and grouping) tasks can be significantly less time consuming when computerized (Bringer et al., 2004). Time saved in this respect can be spent more profitably by figuratively inhabiting the data – reading, absorbing, considering the data and, through the strong familiarity thus made, drawing potential connections, conducting data analysis, and theory creation (Kelle, 2000; Wickham & Woods, 2005). There is also the mundane but important benefit that it is easier to make multiple backups of an electronic file than large amounts of paper (Bringer et al., 2004). In addition, analytical tasks that are impractical and challenging with paper methods become possible when using software designed for this purpose. Computers allow ease of indexing or coding, data retrieval, complex searches and easier design of graphical representation of conceptual schema (Bringer et al., 2004; Wickham & Woods, 2005).

Specifically, coding can be conducted on a more complex level (Wickham & Woods, 2005) and, in the words of the designer of the program that became NVivo8, software can help the researcher “in the discovery and management of unrecognized ideas and concepts or the construction and exploration of explanatory links between the data and emergent ideas to make fabrics of argument and understanding around them” (L. Richards & Richards, 1998, p. 213). During initial analysis, I encountered numerous themes and sub-themes, and multiple interpretations. Through nodes and hierarchical node trees, NVivo8 makes it easier to manage multiple themes and add, delete, or merge categories to include, enhance, and reflect nuances in the data (Pope et al., 2000). If codes created at the start of analysis are unsupported by the data, NVivo8 allows the researcher to recode data along newly-emerging themes (Weitzman, 1999). Built-in memo functions also allow researchers to note potential theoretical ideas alongside the data that stimulated their thinking in a particular direction (Bringer et al., 2004).

A final key benefit of using computers in qualitative data analysis is that the process can aid transparency (Bringer et al., 2004) because researchers can clearly show consumers of their research the steps taken to create theory and meaning from the data. Computers allow the researcher to document a coherent, systematic, explicit, consistent, comprehensive, and rigorous approach (Kelle, 2000; Weitzman, 1999). However, Bringer et al. (2004) caution that, for this to be true, the researcher must be experienced in qualitative research and/or well taught in the fundamentals of the software use and research methodology. While NVivo8 cannot address shortfalls in research methodology, it nevertheless provides an “audit trail” for the audience. By noting the steps taken and analytical scheme constructed, NVivo8 allows for the recall and explanation of analysis that provides a justification for the conclusions reached by the researcher (Wickham & Woods, 2005). The ability to check findings against the data by using analysis software increases the chance of identifying disconfirming data (Kelle, 2000), forcing the researcher to refine concepts and theories until a strongly supported analytical framework is reached (Weitzman, 1999).

3.6 DATA ANALYSIS

I commenced with a deductively derived node tree for initial coding in NVivo8, using elements from the literature reviewed in chapter 2 as a guide. The review clarified what constitutes identity work so that I could code deductively for these tactics. However, because this is a young field, I also coded inductively for types of identity work that may not yet have appeared in the literature. The sensemaking literature proposes a sequence in which sensemaking occurs and identifies seven elements of sensemaking. Included in the initial node tree were branches for

(among others) sensemaking, identity, identity work, funding, and institutional-related issues, each with a number of child nodes, as derived from the earlier literature review. This structure was very detailed but provided a useful way of sorting and searching through data and groups of data. I began coding each interview according to this initial structure, but soon started to refine the node tree and recode data into new nodes. I combined some nodes, such as those of the sensemaking sequence and elements. I also added nodes for each interview question because there were times when it was helpful see all participants' answers to the same question. The final node tree is shown in Appendix B.

Although I started the analysis by looking for any clear differences in the data gathered from the two groups of faculty – those with lower and higher funding levels, as well as for any differences between the sexes and types of department (clinical versus basic science), it became apparent that results did not fit neatly into these groups. Instead, it was more helpful to examine the data systematically with each research question in mind. For example, when writing about sensemaking, I started by thinking about particular stories that immediately came to mind from interviews. Then I looked at the sensemaking nodes and related areas such as identity and funding difficulties. As vignettes appeared appropriate to illustrate points, I grouped them and began sewing them together into a broader theme. Screen shots from my use of NVivo8 are shown in Appendix C. They show three broad steps I used during analysis: coding each transcript, examining answers to each interview question, and looking for themes within each node. These steps were overlapping as I iteratively coded, analyzed at various levels (individuals, interview questions, research questions, single nodes), and wrote memos about how particular stories might suggest emerging themes.

I repeated this approach for each of the four research questions, returning to the literature as needed – particularly with regards to identity work. I found it helpful to continue to pull out

from NVivo8 the most poignant or powerful vignettes as I repeatedly re-read the data. Working from a set of quotations that I sensed had a related theme, I wrote about the vignettes, constantly resorting, reorganizing quotations, and thinking of cases that might not fit the meaning that I was creating from the data. A number of word search queries in NVivo8 helped me find disconfirming data so that I could reanalyze and re-write the findings to refine my discussion of the data.

When I had written a complete draft of my findings, I extracted data and discussions presented about each participant and sent the relevant collection of these sections to each individual. I asked them to respond within ten days with their feedback on my interpretations of their experiences, and subsequently sent two reminder emails to those who had not responded. No participants requested major revisions. A minority clarified elements of their stories or suggested more appropriate words. No participant requested a meeting to discuss or refine my interpretation of their story.

4.0 MAKING SENSE OF THE THREAT OF TENURE DENIAL AND FUNDING EXPERIENCES

4.1 THE CONNECTION BETWEEN TENURE AND FUNDING

The link between tenure and funding at the medical school was noted by all research participants, but there was a split in responses according to funding status. The lower-funded faculty were unanimous in their positive response to the question, “is there a connection between funding and tenure.” Many responded quickly and definitively in affirmation, as exemplified by one response of “Hell yeah!”¹, which was subsequently followed with:

[This institution] is notorious for valuing funding above most other things. Funding and if you have the Science or Nature article. They’re not into having the effect on the field through the smaller journals, but they’ll accept that if you have good funding.

It became apparent, however, that not just any funding would satisfy tenure committees. Two participants had been told that their non-R01 independent grants would not be valued by tenure committees as a sign of independence and recognizable professional success.

¹ Quotations from participants in this chapter are edited to correct English, where necessary, to mask nationalities of participants. Where the meaning is clear but the words are ordered differently, square parentheses are used. Hesitations, stutters and repetitions of words are omitted unless otherwise necessary (and indicated) to demonstrate the emotion that accompanied a quotation. An ellipsis indicates that a few words have been omitted; it does not indicate a pause in speech, which is represented by “[long pause]” unless otherwise indicated by a footnote. A hyphen is used when the participant changed the direction of their sentence while talking, with the original words and unfinished thoughts included in the quotation.

The higher-funded faculty were less definitive in their responses. While all stated that there was a clear link between obtaining funding and being awarded tenure, five of them noted that there were other important considerations. Funding was “one piece of the pie” but publications were also critical; one participant thought them to be more important than funding. They did not share the view that only publications in the highest impact journals are valued. Instead, a steady stream of senior author publications was considered important. Continued productivity in publishing was viewed as demonstrative of research independence, which one participant thought was the most important consideration, especially when linked with an R01 that has been renewed, since this shows a clear independent, successful line of inquiry, as judged by peer reviewers in a competitive environment.

The difference in responses between these groups suggests the importance of funding for research faculty in the tenure stream at this medical school. Only once they have obtained R01 funding do they appear to feel confident enough about their tenure prospects that they can consider other factors that tenure committees may seek in a tenure portfolio. This situation is reflective of Roccas and Brewer’s (2002) observation that “under stress, individuals often focus on the central features of stimuli and neglect peripheral characteristics” (p. 99). In this case, the central features of stimuli are the main components generally acknowledged as necessary for tenure – external research funding. Only once this goal has been met – i.e., the faculty member has been awarded an NIH grant – can individuals’ social complexity increase and incorporate more roles, appreciating the other multifarious roles in which faculty must excel to be awarded tenure. As a result, funding becomes the primary goal for faculty, perhaps surpassing tenure. This understanding is important to answer part of the first research question – how faculty make sense of tenure denial. Instead of being concerned about tenure denial, faculty appear to be more focused on securing funding.

4.2 THE MEANING(LESSNESS) OF TENURE

Three factors contributed to a perception common among faculty participants that tenure held little practical meaning for them. The first was the fact that in this medical school, faculty recognized that tenure is accompanied by little or no salary guarantee – it is commonly understood that tenured faculty whose principal duty is research receive little salary from the institution, with their salary coming mostly from grants instead. A number of faculty, particularly in clinical departments, felt pressure to provide 100% of their salary from grants. Additionally, several participants noted that without grant support, a tenured faculty member is liable to experience salary reductions. One participant noted that even with these reductions, it is up to the department to provide salary support for unfunded faculty, and that his/her department did not have sufficient financial means to cover salaries of even three faculty members at reduced salaries. Therefore although tenure provides a *position* for life, it does not guarantee *income* for life in the same way that it might for faculty with significant teaching loads in other schools at the same university. One faculty member commented that tenure “was supposed to be about job security, but [at this institution it] is job *title* security, [rather] than job security, right?” This theme is not singular to the medical school in which I conducted this research, as is increasingly documented by research and journalistic reports (e.g., Bunton & Mallon, 2007; Wald, 2009).

A second factor that reduces the importance of tenure is that it has, for some, become removed from its original purpose of preserving academic freedom:

Academic freedom is constrained now by funding. So you can't just work on whatever you want to.

Another participant also noted a loss of academic freedom during the pre-tenure years. Although not specifically using the term academic freedom, (s)he commented:

During those five years, maybe you just fold up your desire, and you just don't do what you really want to do. Just forget about it and just pursue what easily can be done. [Do what impresses other people]. I mean don't think about yourself – think about other people, the reviewer.

Although the latter comment indicates what some faculty believe is necessary to get tenure, the first comment, linking this attitude to funding specifically, shows that the constraint of academic freedom spans the career spectrum of anyone seeking grant funding, not just during the pre-tenure years. Even with tenure, there is no guarantee that one can study whatever one likes; the choice of research questions is driven partly by what will appear fruitful to peer reviewers and relevant to funding agencies.

The third, and perhaps most pressing factor for many faculty, is that grants, rather than tenure, ensure the continued ability to conduct research. A loss of funding can push researchers into the “no” cycle (figure 3). Starting at the top of the figure, a tenured faculty member with no funding has no means of paying laboratory personnel to do experiments, and nothing with which to purchase supplies and equipment necessary for experiments. Therefore, his or her research agenda will not progress. As a result, no data will be produced, inhibiting the faculty member's ability to produce papers. With *no* papers or data, the faculty member will not have a strong grant application, as experience in the field of research (demonstrated by publications) is necessary to demonstrate competence to grant reviewers, and data relevant to grant applications prove that certain experiments are viable and within the ability of the applicant. Without strong grant applications, the faculty member is unlikely to secure funding, and thus the cycle continues.

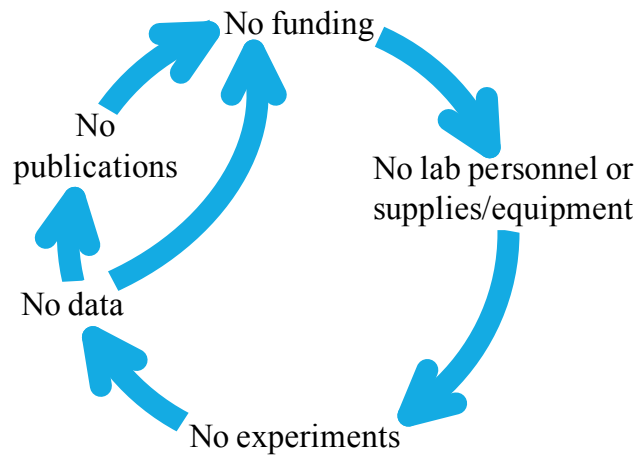


Figure 3: The “no” cycle

The cycle is simplistic in that it ignores the question of whether a research problem proposed in a grant application is important and whether the applicant’s approach is innovative and likely to succeed. Nevertheless, it shows a cycle described by a number of faculty that appeared to represent a greater source of threat than tenure denial. The threat was felt acutely by participants because, even with a highly significant research problem and novel, appropriate research approach, without funding a stocked and staffed laboratory, it is difficult to prove that innovative ideas can become a viable research project. Since the medical school has no a strict “up or out” policy, faculty not granted tenure but who have funding can remain in their jobs and conduct research, albeit with a change of title. However, the reverse is not true, in that faculty with tenure and no funding are likely to struggle to maintain their research programs.

These three factors – little salary guarantee, reduced academic freedom, and the imperative of external funding – combine to create a strong impression among faculty that tenure is almost meaningless in this medical school (table 6). Two faculty spoke of seeing tenure as a game, allowing them to relax about the tenure decision and put it into perspective as less

important performing their other roles well, such as advisor to students and researcher. Asked about approaching the tenure decision, several faculty reported feeling detachment from the process, indicating they had little concern regarding the outcome, and a negative result would not have severe ramifications for their career (table 6). Nevertheless, tenure was seen as useful to validate faculty as researchers, both personally and in a more socially-relevant manner in the eyes of colleagues and future recruiters.

Three of the participants who provided the quotations in table 6 were highly funded, which perhaps allows them to see tenure in a less serious light than others, since their work has already been validated by peer reviewers in the scientific community through successful grant applications.

Table 6: The meaning of tenure

Theme	Representative Quotations
Meaning of tenure	<p>“So tenure at this university means nothing, right? It just means nothing.”</p> <p>“I’ve realized this: [tenure] doesn’t mean anything! On the tenure track, or tenured, either way it’s all driven by grants and it’s driven by what work you do. And if you do a good job, it doesn’t matter either way.”</p> <p>“It doesn’t mean a thing. [It’s] on paper, I mean it doesn’t mean a thing practically. Because it doesn’t protect you ... you still have to bring in all your money, especially in a school of medicine I think it doesn’t make a difference. It’s really just for the prestige of it. And honestly that’s the only reason I would want it. That’s it. Really. It’s as vulgar as that. [laughs]”</p>
How it feels to approach tenure	<p>“I feel emotionless about it [laughs]. I feel like it doesn’t really mean anything and it’s quite annoying, I think, that they even have it. And so I feel like I’m playing a game, and it’s time for me to put in my stuff, and play the game.”</p> <p>“Well I would- I guess I would feel bad if it came out badly. [laughs] My ego would probably feel wounded.”</p> <p>“I would imagine that me just not getting tenure, it’s like, ‘oh, you know, bad [speaker’s name]!’ ”</p>

4.3 MAKING SENSE OF FUNDING EXPERIENCES

With tenure thus established as secondary in importance to funding for many faculty participants, I now turn to how faculty participants make sense of their funding experiences, which may be more relevant as an identity destabilizer than the threat of tenure denial. I use Weick's (1995) seven elements of sensemaking as a framework through which to understand how faculty do this.

4.3.1 Sensemaking is grounded in identity construction

The professional identity of the faculty participants was fundamental to their sensemaking. The majority of faculty stated that they were defined by their profession; being a scientist was more than just a job for them – it was part of their identity. Some faculty whose research sat at the nexus between several fields were uncertain as to whether their professional identity was as scientist or engineer, both due to their research agenda and their approach to finding answers. Nevertheless, these faculty, like most others, self-identified as academic researchers. For many, being a scientist in industry was not a plausible identity because it would not allow the same flexibility and freedom in research as academia, even when academics are constrained by the need to comply with granting agencies and reviewers' preferences.

Some participants' professional identity development as a scientist was a function of the sheer amount of time spent in training as a graduate student and postdoctoral fellow. They were so “vested” or “invested” that they could not separate themselves from their work. Many faculty spoke of constantly thinking about their research and feeling completely immersed in it (table 7). The first quotation in table 7 links one's identity with the subject of one's thoughts: “what you

think is what you are.” If this relationship exists commonly, the extent that research is on the minds of faculty participants underlines the strength of their identity as researchers. As such, it has come to dominate other parts of some participants’ identities. Many participants spoke of being so thoroughly engaged in their research that it became difficult to disentangle it from their independent senses of themselves.

Only one participant stated that (s)he was driven to academic science for the teaching. Other participants expressed horror or disbelief at the thought that if their research did not work out they could teach instead of conduct research.

For about half the participants, both higher and lower-funded, *being* a scientist rather than just *doing science* was a critical component of success. One highly funded participant thought that only unsuccessful faculty would *not* define themselves as a scientist:

A few people probably are doing science more as a way of making ends meet. ... It can result from, for example, not having made successful discoveries. And so, they lose interest in their career. So they become more subdued. They probably go, give up on their funding, for example. And, you know, they come in the morning and look around, and you know, they go home. So yes, there are a few people who have probably given up being a true scientist. But by and large, you know, to be a successful scientist, you have to *be* the science, you have to be in full gear in full life all the time.

This sentiment was echoed by Peter, who found himself thinking of his research more as a job as he became more disgruntled with the compromises he felt he was having to make in the professional environment, which is discussed at length as part of the answer to the second research question.

Table 7: Professional identification with academic science

Theme	Representative Quotations
Immersion in research	<p data-bbox="418 371 1472 520">“I think [being a scientist is] kind of 100%. Because, what you think is, you think about what you’re doing. I mean even when you get home, you just think about what you are doing, what you are going to do tomorrow at work. What you think is what you are, right?”</p> <p data-bbox="418 554 669 590">“We are obsessed.”</p> <p data-bbox="418 623 1398 659">“I could not walk away from science. It would have to be catastrophic now.”</p> <p data-bbox="418 693 1472 772">[Prior to parenthood] “science was ... 90, 80% of our life, if not more. That was it. I did not regret it. It was a good time actually, I think.”</p>
Professional identity dominates global identity	<p data-bbox="418 774 1292 810">“I think I’ll always be a scientist. I’m naturally curious all the time.”</p> <p data-bbox="418 844 1472 982">“I’ve often wondered, if I didn’t have my job tomorrow, and let’s say I stopped working tomorrow and somebody asked me, ‘what do you do?’ ... I would have a lot of trouble not saying I’m a scientist. Because I do find that it defines me.”</p> <p data-bbox="418 1016 1472 1264">“[<i>Being</i> a scientist] has been part of my personality, the way I measure a cup of coffee, you know. It’s quite accurate, it’s not like I just pour something. The way I argue with my [spouse], for example. It’s like writing a project, or discussing it, you know. Everything is in detail. So even if I lose my job here, and then, I don’t know, drive a cab tomorrow, I think I still would be, in <i>soul</i>, a scientist. You know, the way I act.”</p>

From table 7, it is evident that the majority of faculty participants had very strong identities as scientists. Even for some faculty who could conceive of leaving academic science, alternative jobs that appeared acceptable to them were generally scientific. For example, one had been very interested in a job as a program officer for one of the National Institutes of Health; another stated that (s)he could contemplate a move to industry while simultaneously admitting ignorance of what that would mean in terms of daily research life. Having a strong identity as a scientist influences any sensemaking by these individuals. Compounding this strong identity is the fact that making sense of funding experiences directly relates to their professional arenas, making their identity as an academic scientist highly salient.

4.3.2 Sensemaking is retrospective

I asked all participants to share their funding histories with me. The very nature of the question, focusing on funding *history*, is retrospective. There were clear instances of faculty understanding being shaped by subsequent consequences of actions, which is a core part of sensemaking (Weick, Sutcliffe, & Obstfeld, 2005). For example, Francis saw, in retrospect, one reason for his currently low funded situation. He had received a fundable score for a large grant, but due to the economic climate in 2008, he was informed at the last moment that he would not be funded. He continued by saying:

And the problem I had at that point was that I'd made a strategic error, which is I'd kind of dropped the R01 for 2008, because I was focused on this [other large grant]. And so I ended up with no money just as my money was running out.

One participant who had self-defined as an artist until the age of twenty commented, "In looking backwards, I was always a scientist." The story of how (s)he moved into science made it

clear that prior to changing career paths, this research was unaware of this future identity as a scientist, but in retrospect it became clear, based on knowledge of how his/her mind worked. Another faculty member, who became a scientist because of the intensely competitive environment in medical schools, presented a similar retrospective view, stating that while having to let go of a plan to become an MD was disappointing,

It ended up being great because I love doing science, and I love doing my job.

And I think I would have been maybe not that happy as an MD.

These retrospective views are not immediately related to funding, but they reinforce a positivity in the participants' identities and career choices. This positive outlook and appreciation of their career becomes an important factor in the resilience exhibited by many faculty in the face of a difficult funding environment, as discussed in the next section.

4.3.3 Sensemaking is enactive of sensible environments

This sensemaking element is difficult to see on a group basis because although each faculty member operates in the same medical school, departmental cultures, personal training, and individual attitudes contribute to each person's specific environment. Jonathan presented a story that is most demonstrative of the interaction between a sensible environment and sensemaking. Jonathan believed that there is insufficient time to achieve everything that is necessary for tenure in this medical school. He explained that it took him a year and a half to receive approval from the Institutional Animal Care and Use Committee and Institutional Review Board for experiments involving animal and human subjects. During this time he could not conduct any useful research. With start-up packages commonly lasting three years, he had only 18 months of

funding remaining before he needed to secure his own grants. He also felt disadvantaged by having no personal connections at foundations that could help him get funding.

In telling his story, Jonathan generalized his experience to all junior faculty members in his area. I cannot know whether Jonathan's environment contributed to his difficulty in securing funding during the period of his start-up funding, or whether his approach to work created perceptions of an environment strewn with barriers to success. Nevertheless, the story of having insufficient time to secure funding was a continuous theme throughout his interview, and is integral to the sense he has made of his experiences.

Other faculty acted upon their environment by being highly proactive in seeking what they need and working to ensure their success. Oliver spoke several times about strategically planning his career progression, saying that "you've always got to be thinking years and years ahead." Terry had a similar *modus operandi*, stating:

Try to anticipate. ... For instance, if [I am] interested in the tenure process, the day I come here, what is it going to take for me to get tenure?

These faculty have taken an active role to make their environment one that they understand and can shape through planning. Rebecca wanted, and eventually was able, to visit NIH to learn how "the system" worked, and another participant engineered a move out of a clinical department in which (s)he felt uncomfortable to one that was a better fit. Despite being in a lackluster funding environment, these faculty felt able to change their situations.

Persevering in this environment has not been easy for many faculty, and the majority of participants displayed extreme resilience to the difficult funding climate. This common attribute appears to stem from the training period for most people. For a few, however, like Sally, it was intrinsic; her global identity was as a positive person. She repeatedly stated she always has a positive outlook, which has allowed her to cope in particularly trying circumstances.

4.3.4 Sensemaking is social

For other participants, the resilience theme is more appropriately described in terms of this fourth sensemaking element. It is more relevant here because resilience in the face of difficult funding situations and negative publication decisions is modeled and taught for many faculty during their graduate and postdoctoral years, and thus becomes part of the shared culture and environment of academic science. This shared culture and environment contributes to the professional identity of faculty participants and, as part thereof, influences their sensemaking. The theme of resilience has several outlets: 1) resilience in the face of the multiple demands on faculty to succeed in the competitive environment of biomedical research in this funding environment and this institution; 2) resilience to negative feedback, such as grant and manuscript rejections; 3) resilience in the face of colleagues or bosses who were damaging to the individual's career or mentality; and 4) resilience to a lack of support, either administratively or institutionally.

4.3.4.1 Resilience to multiple demands

A number of participants felt that they simply could not work any harder than they had been. Adam articulated this sentiment as he described his relative comfort regarding the tenure decision:

I think I'm doing all the right things. Or at least I know I can't work any harder because [laughs] I don't sleep very much and I don't see my family very much.

Apparent in this theme is the cultural norm of extremely long work hours of faculty, who work evenings and weekends in addition to their regular work week. Part of the reason for long hours may be the high level of immersion in their research (portrayed in table 7). One may question whether faculty work long hours because they have to for professional success, or because they

feel intellectually compelled to do so. Regardless of cause, however, this theme shows that resilience in the face of multiple intense demands for productivity is a social norm in this medical school. This hard work becomes a lens through which faculty view their funding experiences. For example, Karen commented:

I'm pretty determined to just keep plugging away at it and kind of take a 'kill it with numbers' approach, you know? Just keep submitting until my probability- if my chances are 5% then I just [laughs] keep doing it over and over. And I'm convinced something's going to hit.

4.3.4.2 Resilience to negative feedback

This statement exemplifies two sorts of resilience – the intense time demands, as grants are an effort-intensive endeavor, and also resilience to negative feedback. This 'can do' attitude was further demonstrated by Karen, who felt that securing NIH R01 funding is “something that I feel like I don't have a choice but to achieve,” as well as a number of other participants. Although the funding levels are low, many participants would not contemplate failure at securing an R01, as that would signify the end of their career as a PI. Similarly, when I remarked to Matthew on his tremendous perseverance in seeking funding, which has recently paid off, he said,

It's either that or I'm going to go work at Wal-Mart [laughs]. You have no choice at that point.

Although perhaps intended as a joke, this comment underscores the strength of the imperative to secure funding that some participants felt.

Resilience to negative decisions regarding funding and manuscript submissions is encapsulated in the advice that many recounted having received from their graduate and

postdoctoral mentors – not to take funding and publication decisions personally, but to respond professionally to the constructive feedback and learn from the comments. Only two faculty (both lower-funded) expressed having difficulty not taking it personally. One described a negative funding decision like a break up in a relationship²:

And..... i-i-it's.. tough. It's tough. It's... uh... you take..... you take it personally. Uuuuuuuuuuh..... aaaaaaaaaaaaaat.. at least I did. Um, uh.... yeah you'rrr-... for a couple of.. days, or maybe a week, you know you're.. I mean, it's like a break up. You know, if someone turns you down, then you're, for a couple of days, maybe, you know, a week, you know, you're down.

This person had earlier described a sub-optimal relationship with his/her PhD mentor, who had not involved the individual in much of the grant or publications process. The other faculty member who expressed difficulty in not taking decisions personally had completed doctoral work in a different discipline from his or her current position and had no postdoctoral training.

4.3.4.3 Resilience to negative colleagues and mentors

The importance of mentors in learning how to view events in the funding environment was evident throughout many interviews, and is relevant to a third type of resilience that was demonstrated by three faculty – the ability to keep going despite damaging relationships with peers or mentors. One participant spoke of being hired by a senior member of the department to work as an independent PI in the same area. However, instead of allowing the recruit to be independent, the mentor became very controlling and performed acts seen by the participant as attempts to undermine his/her reputation and confidence. After three years of this environment,

² In this quote I include the extensive pauses, elongation of words, and repetition of stalling phrases (“you know”) to convey the difficult emotions portrayed by the faculty member as they spoke this. The length of pause is indicated by the number of periods. Drawn out words are indicated by multiple vowels.

the faculty member enlisted the help of the department chair to rectify the situation. Another participant had been recruited to a PhD position with funds that did not belong to the hiring mentor. When the funds were returned to their rightful place the participant struggled politically and fiscally to complete the degree. A third faculty member described a “hypercritical” postdoctoral mentor and another colleague who would not provide support even during a difficult period. Despite experiencing these negative relationships, however, each of these three lower-funded individuals continued in their academic scientific role, displaying strong resilience to hostile environments. This contributed to their sensemaking by offering a perspective that things could be worse than they currently were, because they had been so in the past. Also, since these three faculty had taken steps to improve their situations, they understood that they were, to some extent, in control of their faculty positions and professional environments.

4.3.4.4 Resilience to a lack of support

The final commonly displayed resilience is in response to low administrative or institutional support. One faculty member in a clinical department described having little to no institutional help, and that the department chair, while helpful, did not have the time to devote to him/her due to the demands of managing a large clinical enterprise. Another faculty member in a clinical department had never met with the department chair individually, and a third said that there was nobody to help with grant submissions, so (s)he always had to prepare documents that in other departments are routinely put together by administrative staff. This lack of administrative help was less common in basic science departments. However, there were several faculty from both types of departments who described a specific lack of institutional and departmental support that they considered to be a result of the tight funding situation. Operating in the same funding environment, senior members of the department have little time to help their junior colleagues as

they try to secure funding. In one sense, this helped junior faculty cope with their funding experiences:

Just hearing about very senior investigators submitting grants similar to what I'm submitting, and getting rejected over and over again, I think, makes me feel like ... this is [not] something personal.

However, they also rued the lack of support as they endeavored to establish themselves:

No-one is really able to sit down [with me], because they're all struggling with their grants. They're all tenured professors. But they're so busy with their own business that it is impossible for them to suddenly worry for [me].

One participant was even wary of trusting senior people's advice because they are competing against each other for the same grant funds:

Because see, you're always in competition, right? It doesn't matter who, even your own friends you're competing with, so think about it: if you get the greatest advice for getting a grant, that probably means that somebody else, who's sending it to the same place is going to get a lesser chance, right? So all these things you figure out on your own. I think that's why they let you figure it out on your own.

4.3.4.5 Summary

In summary, the resilience theme is pervasive among all participants, and is often displayed in multiple contexts. This social aspect of sensemaking, shared among faculty as part of a common culture, creates an understanding that failures are normal but competition is tough, that they have to look out for, and act for, themselves first and foremost, and that hard work can ultimately pay off.

4.3.5 Sensemaking is ongoing

According to Weick (1995), an interruption to an ongoing course of life makes people aware of a situation as they pay attention to the unexpected interrupted influence. In some cases, my interview acted as this interruption. Although I tried to minimize comments to faculty that may have presented a radically different view than their own, some of my questions encouraged faculty to articulate thoughts that they may not have pondered previously. These episodes were characterized by protracted pauses in speech, the beginnings of words that were subsequently changed before they are finished, and multiple verbal fillers of “um,” “er,” “you know,” and so on. For example, after Beatrice described some identity work, she stated³:

Well I’ve never... put that into words before. I’ve just been- it’s in the back of my head, so I’ve never..... put it in words.

Because the funding environment has been difficult for a protracted period, little ongoing sensemaking about funding experiences occurred during the interviews. Funding levels have been the subject of numerous journal articles and are much discussed in the halls and offices of this medical school, so funding difficulties are not often an unexpected interruption. However, one lower-funded faculty member discussed a recent recommendation by his/her chair that (s)he consider a temporary removal from the tenure stream, since it could be preferable to promotion to associate professor without tenure⁴:

So w-with associate, I would have to.. then.. start.. I would get promoted to associate professor, but then.. I don’t know, it..... it I think I’d buy a little

³ The length of pauses in this quotation is indicated by the number of periods.

⁴ Pauses (indicated by periods), word repetition and verbal fillers are included in this quotation.

more time with a type A removal, and... his.. thought was that... um..... that I'd...
getting an associate professor without tenure is.... um... not an easy..... task.

This faculty member appeared to be in the midst of trying to make sense of the department chair's recommendation during the course of the interview, and reconciling it to his/her own hopes and expectations. Having earlier expressed surprise at the chair's recommendation, (s)he seems here to be trying to frame it in positive light, to turn a negative interruption into something positive – more time to secure additional funding and build a strong tenure portfolio. The ongoing sensemaking was more often focused on identity matters because these were, for many, new areas of conscious reflection during the interviews.

4.3.6 Extracted cues

As a result of the widespread recognition of the difficult funding environment, there are many extracted cues particular to it. Every faculty member commented on the funding situation to some extent. Weick (1995) notes that cues need to provide some action. For many, the action was to write multiple grant submissions (e.g., Karen's quotation on p. 88). A recent change to the NIH grants policy, instituted around the time of the first interviews, is that PIs are now only allowed to resubmit a grant once; previously two resubmissions were permitted. At the same time, grant application page limits have been reduced from 25 to 12, and a new structure introduced. Participants appeared to be still coming to terms with these changes, which affect the actions they might take as a result of their sensemaking. For example, one said:

I feel like you can get success, but it's going to be slower. You might have to revise more often. Well, you can't revise more often. We'll have to see how that goes [laughs]!

Another said that scientists were more focused on what a successful new-format grant would look like than the low level of the current paylines.

Daniel perceived the change in the economy to affect how colleagues interact with each other:

It probably made it less comfortable for me to be a scientist in this environment.

Not because I personally struggle so much with funding, not at all, actually, right?

Or [because] I'm afraid to renew it on a personal level. But it raises that sort of anxiety, the competition level around me. And that probably makes people only less interested in what I actually have to say scientifically.

As faculty interact less or listen to colleagues with less regularity, being focused on grant submissions instead, they may lose collegiality and unintentionally alter departmental cultures. This can be detrimental to junior faculty in particular, who need feedback on their science as well as informal mentorship from senior colleagues. In this way, the extracted cue of disinterested colleagues – a function of the poor funding climate – was demotivating to other faculty.

Isobel saw the funding environment as a threat to her continued line of research. Discussing the renewal of her R01 in two or three years' time, she said:

The year ahead, I probably have to start worrying about whether I can renew it or I have to develop a new area. I might have to.

The action that she viewed as an appropriate response to the climate is to change research paths – something that others may consider a drastic move, but she saw as possibly her only option.

In contrast to sensemaking and associated actions resulting from the funding environment's extracted cues, several faculty saw the environment, or specific experiences within the environment, as a way of removing some of the burden of not securing funding. This

perhaps drives the action of continuing to conduct research unhindered by self-recrimination. For example, Matthew said:

Struggling to get funding, especially these days, I don't think that's a negative. That means you're really working, and you're doing as much as you can. And, you know, the ability to get funded nowadays I don't think is necessarily a sign of success. It's just a sign [laughs]. A sign really of poor leadership in Washington [laughs].

Luke explained the reason that his R01 was not funded as a combination of a low payline and the fact that, as a junior faculty member, he had not yet had a chance to publish independently:

Maybe each reviewer has five grant proposals. Of these, maybe one is crappy, and the other four are all ... good. But they have to choose, pick one. So they have to look for, you know, stuff that they can sort of throw off something. I mean, in my case, I hadn't published as an independent researcher. But I'm new faculty so [laughs], yeah.

This reframing of the environment echoes sentiments expressed by senior faculty in an earlier study (Robinson, 2009), where luck and the idea that funding decisions are random are used to explain grant success or lack thereof. This absolves faculty of blame, making the problem environmental and therefore allowing them to continue their research with perhaps less of a psychological burden of failure.

4.3.7 Sensemaking is driven by plausibility rather than accuracy

The common theme of attributing funding success to luck was common among higher-funded faculty. There is no way to know if this was true or merely a function of modesty, but it is

plausible and a commonly-accepted manner with which to discuss funding success. Adam, a highly funded participant, remarked the following when discussing his confidence about future funding:

Doing good work and working hard are only a part of the whole picture, right? A lot of it's luck.

Isobel, also highly funded, said,

[You] give it your best. It also takes a bit of luck, I think. Hard work does not always pay off in research.

Ultimately, the experiences faculty related during their interviews were founded on their opinions and interpretations, not all of which can be verified as accurate, but which are the reality for the faculty member in question. This is inherent in phenomenological research, which studies the meaning people make of their experiences. As such, as long as an interpretation *makes sense* for a faculty member and is truth for them, it will drive action – even if it is merely the action of continuing the constant struggle to secure funding.

4.4 SUMMARY

Tenure threat does not appear to be the trigger for identity work for these participants that I had originally thought it would be. Rather, the trigger they articulated is the threat of losing or not having funding, and therefore losing their laboratories. Most participants had strong identities as scientists and could not imagine other fulfilling professional positions. In reaction to the threat of losing their laboratory, faculty members developed strong resilience to the variety of challenges they faced. They recognized multiple factors in the final funding outcome, not seeing the

decision as a pure reflection of their science. However, at the same time, some were more aware than others of their ability to craft their own success, being proactive in an attempt to get what they needed to be successful.

5.0 THE SHAPING OF PROFESSIONAL IDENTITIES IN THIS ENVIRONMENT

The resilience theme that emerged through faculty sensemaking during the pre-tenure years is at the core of my second research question. For most participants, a strong professional identity as a scientist is the defining role; for others it is one of several roles. In answering this second research question, I concentrate mainly on the former, larger, group (14 out of 18 participants; the remaining four are those conducting negative identity work, as described in chapter seven). The reason for this is that with only one central role-identity – that of biomedical faculty member/PI – if the organizational, environmental or social/professional influences do not directly fit with their own view of themselves or what the role should entail, some compromises must be made to survive. Having been socialized to a specific set of norms and a particular environment during doctoral and postdoctoral study, individuals may have encountered a new institutional culture and set of work tasks as they assumed a faculty position. To reconcile their expectations and the emergent reality, faculty may have had to change how they think about their work or themselves as professionals. This is how unmet expectations cause first *professional identity inconsistencies* and then end up shaping professional identities during the reconciliation of such inconsistencies. The six types of unmet expectations that arose are: 1) the nature of science; 2) academic freedom; 3) scientific ethics; 4) independence; 5) faculty work; and 6) academic capitalism. These, in aggregate, help show how faculty professional identities are shaped or constrained.

Participants who were able to access multiple roles and identities easily, thus displaying a high social identity complexity (Roccas & Brewer, 2002) were able to rely on a wider range of identities with which to deal with any situation. Therefore, for these participants, unmet expectations were likely to have a less troublesome effect on professional identity.

5.1 THE NATURE OF SCIENCE

Many faculty were acutely aware of differences between what they had expected when embarking on their independent careers and the emergent reality in academic science. One of the broadest differences pertained to what the nature of academic science looks like and how it is conducted. For example, in response to a question about characteristic qualities that are typical of a scientist, Daniel answered:

Well that, I'm afraid, will differ between what I think a scientist should be ... or maybe how I imagined they were before, and how most scientists are now that I see around here.

Similarly, Peter spoke at length about his notion of the "ideal prof," as embodied by one of his mentors who created and defined a new field of research, in comparison to the faculty role that he and other colleagues had been forced into. Whereas the "ideal prof" persuades colleagues of a new theory or knowledge and advances the field, today's faculty member makes incremental advances, constrained by peers who allow logistical problems to influence what they see as a good scientific idea:

What's different these days is that I keep hearing arguments being modified by logistics. So logistics are answering the arguments. So people will say that, "Oh,

well that's not a good idea" because it can't get funded. But ultimately, if it's a good idea, it's a great idea. And maybe it's just a matter of translating that – what they mean is we can't do that idea now because it won't get funded. But I hear people interpreting empirical findings using outside arguments. So, using information that's really outside of the argument, like funding who was most influential, or who has the most authoritative view, or what the authoritative view is. And ultimately, I don't think that it's a sound argument anymore.

The problem expressed here is not one that faculty members can ignore as merely an irrelevant argument if funding decisions are being made by those whose views Peter described. He was affected by what he saw as a widespread, myopic understanding of how his field should be approached, with more interest on the molecular level than a holistic view of the patient. However, to win approval among faculty peers and to be successful nationally, he has had to compromise his scientific approach until he has tenure. He criticized the funding system here for encouraging a disregard of ethics in his research – a direct violation of his identity:

People don't ask ethical questions about what they do often enough to realize that there are ethical considerations to even their current R01. So if you have an R01, ... everyone knows how to write a grant and tell the reviewers that the grant is valuable, will have yielded some knowledge [at the end] that will immediately change the field. But ultimately, so people truly believe this? I mean, it's called grantsmanship just because of this behavior devoted entirely to the grant, and not to taking care of the patient at all.

Peter's and Daniel's criticisms of how science is conducted today illustrate inconsistencies in their professional identities. The inclusion of their quotations here is intended to depict the general malaise about the nature of academic science for some faculty.

5.2 ACADEMIC FREEDOM

Accompanying this malaise are concerns regarding academic freedom. I mentioned these concerns earlier in relation to the meaninglessness of tenure. Here it becomes a violation of professional expectations. Inconsistencies regarding expectations of academic freedom emerged from several faculty members. Daniel viewed academic science as having become a competition. To compete, scientists have to contribute to the existing “snowball” of data, using similar techniques or theoretical bases, contributing to a question that already exists and that has been shaped by researchers in the field. Daniel accepted this as part of expanding scientific knowledge, but said:

Where it becomes really bad, unbearably uncomfortable, is to be in a position – to choose such a position – that you are not able to [add to] the same snowball, right? So they say, “We are adding to the snowball, but you are free to do whatever you want. We might not be interested in it, but you are free to do it.”

That would be still okay. But that’s not the case anymore. Because [they have the attitude of] “how is it that you are not participating in our competition?”

Pressure to conform to existing ideas in his field made Daniel feel that he was antithetically positioned from his notion of what it means to be a scientist, which was someone who is “not swayed by the prevailing opinion.” However, failure to join the competition results in a lack of social, professional, or financial resources. Daniel, like Peter, felt that he must forsake his scientific ideal to be respected and participate in the competitive environment.

Jonathan found himself in a similar situation. He was originally motivated to conduct research related to a specific disease after reading about a child with the illness. However, his current work was unrelated to this disease; he felt trapped because it takes substantial time to

become successful in a different area and he would not have funding in the new field until he is established, which is difficult to do without initial financial support, as detailed in the “no” cycle (figure 3). Reflecting on this, he said:

Because of the [funding] situation, you limit your creativity. You limit your imagination. ... You have something you want to do, but if you do it, you need a lot of time, a lot more time. Let's say five years from now you can get some results. Then you don't even think about it. I mean, just forget about it. ... So, sometimes you know, that thing is something you just always think about, but you never do it.

Jonathan found his inability to pursue what he is most passionate about both frustrating and a “heavy burden.” He compared his expectations of academic freedom with what he felt he had to do to be successful in this way:

Of course the real reason why you chose an academic institution is freedom to do what you want to do. But in reality, that was not the case, at least in my situation. [You have to] just pursue money and publications, not what you want to do. If what you want to do is very risky, and you don't have a kind of foundation to build a folder, you cannot do it. So [long pause], you can't, that's it.

Compromising on a research topic negatively affects professional identities because it reduces the meaningfulness of work. Peter and Jonathan both said that as they continued along a path or method of inquiry, they started to see science more as a job rather than their passion. In other words, they began to lose motivation, which would rapidly return if they were able to conduct their research as they desire. Daniel considered his problem to be an environmental mismatch, and felt that he would be more comfortable in an industrial environment, even though it is commonly perceived by others that industry limits academic freedom. He too has

experienced a decline in his enthusiasm to participate in the culturally accepted manner within this academic institution.

5.3 SCIENTIFIC ETHICS

Another set of unmet expectations, described particularly at length by Francis, appears to be equally demotivating: the contrast between personal ethical principles and the behavior of others that violate these principles.

Francis told a story of betrayal by his chair. Having not received a large grant immediately after the economy fell in late 2008, Francis' chair gave him a letter stating that if his salary was not 50% funded from external grants one year later, his contract would not be renewed. Nine months later he received a grant that increased his salary coverage on grants to 85%, but his chair said his contract would not be renewed anyway. Ultimately, senior faculty were able to intervene on his behalf, but Francis expressed shock and disbelief that his chair would be comfortable going back on his word and not honoring the implication of the letter – namely that if he covered more than 50% of his salary on grants he would retain his position. Francis continued his story by noting that soon after that episode, he had a paper accepted in a high profile journal. He communicated this to his chair, who responded by permanently removing him from the tenure stream. He appealed this decision and his removal was made temporary (a type A removal rather than a type B).

Reflecting on these stories, Francis did not think his experience was unusual, given the difficulty of securing resources for research. In commenting, “it’s not just about science anymore – it’s a fist fight,” Francis acknowledged that principles are compromised in this competitive

environment. Although it is not possible to pass judgment on Francis' experiences with his chair, his tangible indignation and his resulting reflection on changes in the culture of academic science in institutions that are driven by research dollars are educative. He described what he sees as corruption of the grant process, and a lack of transparency over many facets of academic scientific life. This view of the professional environment, he said, "leads to a lot of insecurity and a lot of unhappiness because if one can't accept anything just at face value, then the world is a kind of disappointing place." This experience has affected him physically and harmed his personal relationships:

I have had enormous personal, physical health, mental problems dealing with what my chair did, because I believe it was malicious. It was a totally inappropriate, dishonest course reversal approach that displayed just the very worst human characteristics – all the things I hate.

What is the effect on Francis' professional identity of experiencing ethical inconsistencies and the competition of the funding environment? During the course of the interview he recounted several alternative career paths that opened up quickly once he began looking, after hearing that his contract may not be renewed. Some are closely related to his current role, others differ but are still in the scientific realm. The variety of positions he considered suggest he has a firm identity as a scientist, but not necessarily as an academic researcher. He has to work towards conventional success in his current role, however, since success at publishing and obtaining grants allows him the freedom of choice in the future.

Although Francis has coped with this experience by gravitating towards faculty whom he respects, he continues to live with "continual disappointment," which is unlikely to enhance productivity and social interaction. Instead, it has made him keen to leave his current position. Since organizational affiliation contributes to professional identity by providing the environment

and colleagues in which, and with which, one interacts, it appears that his experiences may, ultimately, lead to a modification in professional identity for Francis. At the time of interview, however, the process or type of this professional identity alteration was unclear.

5.4 INDEPENDENCE

Sally experienced a similar betrayal by a senior faculty member whom she perceived as having tried to control, rather than mentor, her. She attributed some of her multiple unsuccessful R01 applications to a lack of mentorship, as well as a change in scientific focus after she assumed an independent position. She said:

If a mentor doesn't mentor, just wants to control you, doesn't want to help you, always does everything [behind] your back, trying to hurt you, or whatever, stop you, then that will be – and is – miserable.

After several years she approached faculty leaders and secured help in extricating herself from what she felt was a damaging relationship. At the time of our interview, she had better mentors who could help her “polish” her grant applications.

The professional identity inconsistency in Sally's case is between her expectations of embarking on an independent position and the reality of working with someone whom she believed wanted to control her. She noted that in one early postdoctoral position she felt like a “slave” who was not invited to contribute intellectually, but whose duty was to perform the experiments so that the PI would have sufficient data for grants and publications. She did not enjoy this situation, and said that only after moving to a laboratory where she could take ownership of research questions and investigate them fully did she begin to feel passionate about

science. With passion for her work came greater success. Thus, her need for independence and autonomy are an integral part of her identity, making life all the more difficult when working with someone who “treats [people (s)he thinks are under him/her] like one of [his/her] properties.”

To have her independence compromised in a faculty position was difficult for Sally. The effect on her professional identity is a refinement in self-understanding; she has recognized that independence and an interesting research question are key to her professional satisfaction. This realization makes her amenable to pursuing other career paths that have these characteristics if she does not secure sufficient funding to continue her research. Sally attributed much of her ability to cope to her natural strength and positivity – both of which are central to the earlier resilience theme.

Luke had a similar postdoctoral experience to Sally’s – a PI whom he described in this way:

At least in the early days, early years, (s)he saw the grad students working for [him/her] as technicians. Someone who will just do the job and doesn’t have to think about it. Although, in the back of [his/her] mind (s)he required that you think. It’s a little complicated!

This experience led him to value independence highly, seeing it as the most important characteristic for a scientist. Only when Luke’s PI moved to another institution before the rest of the research group, meaning that Luke had little interaction with his mentor for six months, did he start to feel like a scientist. His focus on independence was so strong that he did not consider people who conduct research in industry as scientists. He called them researchers instead. At the same time, he presented several stories to show how firmly engrained in his nature and identity the role of scientist is. These two points together suggest that the threat of losing the independent

position of PI (a strong possibility if funding is lost) could act as a professional identity destabilizer for Luke. If he were no longer independent, by his own reasoning, he may no longer feel like a true scientist. This situation had not arisen for Luke; he expressed confidence in his ability to secure funding before his department decided whether to recommend him for tenure. He believed his science was strong and that he still had time to publish his first paper independently and write a successful R01 application.

Luke and Sally were not alone in prizing their independence. Victoria felt that if she had to find another job, it would not be one where she would “just be in the laboratory doing benchwork” because she wants to “feel that [she has] responsibility, that [she’s] respected.” Independence was key to the completion of professional identity formation for a sizeable number of faculty, who felt that they only started to feel like scientists when they had their own laboratories and were publishing independently. In light of this, Luke’s and Sally’s cases illustrate the effects of particular PI managerial styles during postdoctoral years on subsequent faculty professional identities. In Sally’s case, the professional identity inconsistency between what she saw as necessary and what she had experienced may have contributed to a difficult relationship with a senior colleague, and could ultimately influence her desire to remain in her position. Luke’s professional identity was firm, but the strength of his belief in what it means to be an academic scientist may cause identity inconsistencies to emerge in the future if he were ever to find himself in a position where he could not financially sustain his laboratory.

5.5 THE NATURE OF FACULTY WORK

In addition to professional identity inconsistencies regarding expectations over academic freedom, ethical behavior, collegial interactions, and independence, some faculty described inconsistencies between what they think the work of an academic scientist *should* be and the reality.

Although productivity in science is driven by bench work in the laboratory, few faculty had the luxury of conducting experiments themselves. This was a source of regret for many. Of all the faculty who mentioned this inconsistency, Hermione's story is perhaps the most poignant. She began by describing a time when she spoke to her son's class about her job as a scientist. After she finished, the teacher asked if anyone had any questions, and her son raised his hand:

"I would like to say, my mom is not really a scientist." And I said, "Why did you say that?" He was in first or second grade. "Because she is a writer." "What do you mean?" He says, "Well you, Mom, you always are writing manuscripts and grants. That's all you do! I always see you writing manuscripts." And I said, "Well you are right, in a way." And that goes back to it. I didn't deeply appreciate it – that's painful.

The reason this was painful for Hermione is that writing grants has little benefit much of the time, since the funding rates are low. She said:

There's all this busy work, but it's not productive. And that's my biggest beef, I guess. I will be spinning my wheels, writing grants.

Instead of conducting experiments, planning new work or analyzing data, the reality of faculty life is that they must relentlessly pursue funding, which leaves little time to follow alternative lines of research that seem interesting but have a higher risk of failure or are unusually time-

consuming. This is a cultural and practical inconsistency in what is expected by the institution of academic scientists.

5.6 THE FOCUS ON FUNDING

Related to this inconsistency, but perhaps more fundamental is the inconsistency in values underlying the focus on funding. Nicola's area of expertise meant that she was highly sought after as a collaborator. Her specialized techniques and area of knowledge contributed significantly to other people's research, but were generally less appropriate as the basis of an independent R01 grant. Nicola was highly funded through collaborations, with small portions of her salary on a number of colleagues' grants. From a financial standpoint, one may think that Nicola has a sustained track record of independent funding that would satisfy any tenure committee, yet she did not feel confident because she had been criticized for not having her own R01. She described her situation like this:

I can bring in money. I can bring a lot of money. But I can bring in money as a co-investigator mostly. Because a lot of people want me on their grants because I fill in a niche of what I do. I was heavily criticized for that, but at the same time I was like, "Well do you really want to support me for an indefinite time, until I actually have my own R01s?" ... And they said, "Well, you'll never be promoted with that kind of [funding] position." And I said, "But I need to bring in that money" and the problem is, it's like the chicken and egg thing, you know. As you put more effort in doing these projects, you have less time to develop your own program. So I'm stuck in this conundrum.

This inconsistency is a clash between practicality and academic values. Nicola had to bring in money to continue research, yet her work was not valued to the extent it might be in a less collaborative field. Her situation had no easy answer because if she shifted the focus of her work to make it more appealing for an R01, she might have had to end some collaborations, meaning that she would lose a portion of her funding. Without this high level of funding she might be seen as a weaker candidate for tenure, and she also would need further financial support to continue her work. In her interview she lamented the corporatization of academic medicine that has created a culture clash and contributed to her current conundrum (for a more detailed discussion of academic capitalism in biomedical research, see Robinson, 2009).

Nicola's professional identity did not appear to have been affected by this cultural inconsistency, but she admitted feeling intense pressure to win an R01 and displayed some confidence in her ability to do so. She said she would not be comfortable continuing her research off the tenure track as that would feel like a lower position with less prestige. As with Luke, there is the potential for her professional identity to be affected should a resolution between articulated values and underlying practical pressures not emerge.

Jonathan also remarked on the corporatization of academic medicine:

I don't know why they have the title of non-profit. Not only [this university], all the universities in the United States. They just concentrate on fund raising and money, money, money, money, money. I mean, yeah, that's the biggest pressure. I mean, because the whole school is chasing money. That's the pressure I feel.

One could argue that it is precisely *because* the institution is a non-profit that it must continually seek external funding, since the revenue streams from tuition and the state are insufficient to cover operating costs. However, this is not the crux of the issue; this quotation serves to illustrate

faculty dissatisfaction regarding the capitalist pressures on the academy, particularly within the biomedical sciences.

5.7 SUMMARY

I have described here a number of examples of how faculty expectations and beliefs regarding their role, the institutional culture, and the culture of biomedical research do not mesh with the reality of their daily lives in this medical school. With the exception of Nicola, the faculty who spoke most about these inconsistencies were lower-funded. Nicola, although highly funded, believed she could have cause for concern with regards to her tenure bid. The lower-funded faculty described here may not have been pursuing their preferred area of research, or may not have felt able to pursue it in the manner they would have liked. Some have experienced interpersonal problems with senior colleagues, and others felt uncomfortable in their environments. Any one of these problems could reduce meaningfulness of work (Pratt & Ashforth, 2003), productivity, or the faculty member's ability to secure grant funding. Therefore, one might question whether these participants are lower-funded because they have experienced these problems, or whether they highlight these issues to explain and make sense of their current funding situations.

Regardless of the cause, these faculty have had to rely on remarkable resilience and coping skills to continue pursuing their profession in circumstances that they see as less than ideal. The resultant effects on professional identity are not always immediately apparent, and in many cases are hypothetical. However, reduced meaningfulness and motivation, a sense of not fitting at the institution, and a desire to rectify some of the inconsistencies are possible outcomes

that could affect faculty professional identities. Some of these outcomes may become triggers for identity work, which helps reconcile inconsistencies; others may be part of the sensemaking by which faculty members understand their current situations.

6.0 TYPES OF IDENTITY WORK

Some participants exhibited clear episodes of identity work, while others discussed potential triggers for identity work but had not reached the point of needing to engage in it. In this chapter I review identity formation and detail positive and negative identity work being conducted by participants. I then describe a type of identity work that I did not find in the literature, which I call *professional identity work*, before closing with a discussion of the coping identity work exhibited by participants.

In answering the second research question of this study, I described how working in the current funding environment and institutional culture has affected faculty professional identities, and some resultant triggers for identity work. During interviews, some faculty were able to articulate triggers for identity work, either in the past or the present. I include two examples here as a prelude to understanding their experience of engaging in, or preparing for the possibility of, identity work. Rebecca, the only participant to discuss completed identity work, spoke about funding pressures as a trigger:

I thought ... this grant, it has to get funded. If it doesn't get funded, my career's over.

When the grant was not funded she embarked on professional identity work to reframe her perspective, which I describe later.

At the time of interview, Victoria appeared to be experiencing the beginnings of identity work. She was questioning her approach to her career, triggered by the increasing competitiveness of getting NIH grants:

How I can be competitive, what should I improve to be competitive? And should I have more papers, I mean, how should I write grants, and *should* I write grants? And it made me think about, you know, plan B. If it doesn't work and I don't have any funding, what should I do? And I have been thinking about it almost every day because I need to have- I'm not an MD so I'm not going back to clinic if I don't have funding. So I need to think about what I'm going to do.

I include these two examples to portray the emotional and psychological stress faculty undergoing identity work can experience. Victoria's statement above was punctuated by many pauses, word repetitions, and points where she appeared to be working out what to say next. Not all types of identity work triggers may cause similar stress, and for some, the result of reconciling identity inconsistencies and answering fundamental questions about themselves or their careers may relieve stress. However, it is important to remember that for many faculty the time before and during identity work can be intense and unsettling.

6.1 PROFESSIONAL IDENTITY FORMATION

Perhaps the least unsettling of the identity work types that participants discussed was the formation of their professional identities.

6.1.1 Role models

The formation of Luke's professional identity was hindered during much of his doctoral training because of his mentor's style. It only emerged when his mentor moved to a new institution, providing some distance between them:

I never had a chance to actually go through the data for myself and learn how to analyze them, 'cos he did that for me. ... Then the opportunity came up when he was gone so then I could do that. That's why I realized [that I was becoming a scientist], and it felt good, because before that I wasn't sure if I was meant to be a scientist, because I didn't have confidence in myself. But then I realized, "Well, I have it if someone else is not doing it for me!"

Luke had the opportunity during a six month physical separation from his mentor, towards the end of his doctoral study, to try on a "provisional self" (Ibarra, 1999) of an academic scientist in a safe environment, knowing that he would subsequently return to the tutelage of his mentor before graduating. Luke's mentor served as a negative role model. Luke states that he watched him "as a PI and a group leader, and I decided I'm going to be the opposite of him," which he continued to do in his faculty position when interacting with his postdoctoral fellows.

Role models, including mentors, colleagues or famous scientists, play an important part in professional identity formation, irrespective of whether their influence is positive or negative. For example, Oliver described learning many lessons about how to be a scientist by reading autobiographies of Nobel laureates. Importantly, however, whether rejecting the behavior of a role model, like Luke, or adopting the behavior of others, like Oliver, authenticity to the individual's own identity is the strongest factor in determining whether particular traits are adopted. Daniel learned his professional behavior by watching others:

Maybe [there is] something that you truly don't want to emulate, no matter how it relates to work. And then maybe, then there are some parts which I recognize would be good for me to emulate, to have a better career for instance. But I still didn't want to because, you know, there is only so much of yourself that you want to sacrifice, right? Especially if it's not actually good for the science you are doing.

Particularly in Daniel's case, the role model of a stereotypical scientist is not one that sits comfortably with him; he rejects the competition that academic science has become. Therefore, his need to be authentic to himself results in an identity tension between his chosen role and how he thinks that ought to be enacted. He ended up conducting professional identity work (described later) to reconcile this tension.

6.1.2 Self-in-role enactment

The interplay between participants' concept of their own professional identities and society's notion of the role "academic scientist" emerged clearly during a number of interviews when I asked participants to describe typical characteristics of a successful academic scientist. Those whose professional identities encompassed something other than pure academic scientist were quick to point out that what they were describing was different from themselves. For example, two faculty members, both highly funded, saw themselves as hybrid scientist- engineers. One of these, Beatrice, responded initially with:

Well first I'd say, I don't know that I think of myself as a scientist, still.

Likewise Adam, who described being clearly socialized into academic science during his postdoctoral years, said, "I'll use sort of my impression of the purists," and contrasted scientists

(who pursue new fundamental knowledge “for the thrill of discovery”) and engineers (whom he sees as “more focused on the application rather than the discovery of knowledge”). In this way, they articulated rejection of their own embodiment of the traditional academic scientist role.

Other participants answered this question by linking their own traits or behaviors to what they considered to be the socially-accepted notion of the role. For example, a participant who had initially thought (s)he would be an artist said you need to be observant. Charles, who saw enjoying academic science as a key characteristic, quickly related this need to the way he runs his laboratory, making it a “fun place to work.” Isobel said, “So people have to like to do new things. *I do.*” In this way, faculty reaffirmed their professional identities by linking their own traits with a more generalized social view of the role. This raises the question of whether faculty emphasize specific qualities in themselves because doing so affirms their identity as academic scientist, or whether they see these qualities as integral to the role because they are characteristics they recognize in themselves. Instead of one leading to the other, it may be a function of reinforcement and success. For example, several faculty who struggled with funding stated that perseverance was crucial, and another said that passion was critical. It is likely that these faculty have been told by others to keep persevering with grants and that to maintain their interest they need to be passionate, otherwise the effort would not seem to have an appropriate reward. When faculty then have success, they reflect on what contributed to it. If they view trying new things or having fun as integral to obtaining their funding, that becomes a key component of being a scientist for them.

Self-in-role enactment is not always directly related to initial formation of professional identity, but is instead a reflection of participants’ current view of themselves as a professional. It therefore foreshadows ensuing identity work. Beatrice, who stated that she did not think of

herself as a scientist, went on to provide a clear account of her negative identity work, which I examine next.

6.2 NEGATIVE IDENTITY WORK

I mean no negative connotations in using the term *negative identity work*. Rather, it is the active separation of identity elements and/or the rejection of a role or identity. Several faculty engaged in negative identity work, but Beatrice provided the clearest case. I therefore describe her negative identity work in depth before complementing her story with episodes of other participants' similar tactics.

6.2.1 Beatrice's story

Beatrice made a conscious effort to separate her work and personal identities, as well as rejecting the role or identity of scientist. Instead, she felt more akin to a researcher-*cum*-engineer who works in a scientific field:

I think in science you're making hypotheses that haven't been proven and you're discovering new knowledge, and I don't feel like that's what I do in my work. I feel like I build things and then I see if they work. But the way I build them is that my hypothesis is always, 'this will work!' [laughs]. That just doesn't seem like a scientific hypothesis.

Her sense of not being a scientist was not only related to how she approached her work, however. It was also a reflection of her personality:

A lot of the things that make someone a good scientist or a good researcher, or a good innovator, are not in my nature. And I try to do them at work, but I don't necessarily translate those into my daily life. But I'm trying to [laughs]. So I'd say I'm trying to be more like a scientist in my daily life, to gather data, to be objective, hold multiple competing ideas in my mind at the same time, select the one that makes the most sense. But it's not *part* of me, I don't think. It's something I try to learn.

As Beatrice tried to incorporate scientific behaviors into her life outside work, she began to experience an identity conflict. Although she felt that she was not naturally a scientist and that she came to work to *do* science rather than being defined by her profession, she found that work had "infiltrated" and "overtaken" her life, remarking "it's really hard to separate work from life."

The increasing part that science played in her identity was predominantly a socially-driven change. Reflecting upon this, Beatrice elucidated the relevance of social identity theory on her professional identity:

I have more of an external reputation now, and people know me because of my work, you know, in some small circle. But that's how they know me, is because of my work, and so maybe a lot of our identity is how other people see us, and now there's this growing circle of people who see me as this researcher. And so it feels more like that's part of me.

How Beatrice saw herself was a reflection of other (professional) opinions about her. While many may have viewed this as a mark of professional success, Beatrice was uncomfortable with this change. She had other roles that she prized in addition to scientist:

Mother, wife, member of my church, human, part of a society, wannabe singer [laughs], all kinds of things.

Allowing her professional identity to define her global identity could have resulted in a loss of these other identities that she also cherished. Beatrice also noted that she did not want her self-confidence to be too closely tied to her professional success:

I think who you are is more about the way you be. You know, your traits. And I don't want to either feel bad about myself because I'm not doing well at work, or feel good about myself because I'm succeeding at work, when that's really external to personality traits and characteristics that really are more important.

Here, Beatrice is separating the functional meaning of work from her ontological sense of self, which Kreiner, Hollensbe, and Sheep (2006) describe as separating role from identity. Her negative identity work is an intuitive use of her high social identity complexity, which “may serve as a buffer against aversive effects of threats to the status of a particular ingroup” (Roccas & Brewer, 2002, p. 103).

I asked Beatrice how she made this separation, because although Kreiner, Hollensbe, and Sheep (2006) see this as an identity differentiation tactic, I felt it was not something that would be easily achieved given the greedy nature of the profession and the larger number of participants who felt defined by their work. Beatrice's main tactic was similar to the creation of an identity hierarchy reported by Kreiner and colleagues, but it also focused on authenticity. At the top of her identity pyramid was her personal identity and that of wife. While she did not overtly state the role of wife as part of her hierarchy, her husband played a notable role in her efforts towards authenticity and therefore brought her motivation for it to the fore. Unlike some forms of identity work, where individuals focus on maintaining self-authenticity in their view of themselves and their behavior, Beatrice instead concentrated on authenticity in the eyes of her husband, who worked closely with her:

He sees me in all my aspects of life. [Long pause then, almost whispered, talking to herself] I don't know. [Pause then normal volume again] I'm not sure what I'm trying to say. Like, he knows what I'm like at work, and what my career's like. And so he knows it's not perfect. So if I ever try to start thinking of myself as "Oh, I'm this researcher, and I'm successful at this," I picture him seeing me and knowing all the things I do wrong, and the things I miss, and the things I am flaky on because I can't do this and, you know, he has a different, a more internal perspective of me than the external person that views me and thinks I'm successful. And so I keep that in mind to remind myself that I'm not that person that all these external people see. That I'm really more complex, whether it's for the negative or positive.

Beatrice therefore reacted against her socially-imposed professional identity and was "discouraged" from presenting herself in a way that her husband would know as untrue to her nature. She also used the same tactic with regards to her children, reminding herself that to them she was just "Mom," and she relied on her religious faith to remind her that there is more to life than work.

Sonia Roccas and Marilynn Brewer (2002) describe the compartmentalization of identities as occurring when "multiple, non-convergent identities are maintained but the individual does not activate these social identities simultaneously" (p. 91). By making a conscious effort to compartmentalize, to separate her professional and personal lives, Beatrice created a mechanism for coping with the stress inherent in working in the current funding environment. She experienced very strongly the "terror" of having to write grants, not for her own career prospects but because of the need to support her staff who have families and financial responsibilities. She felt as if she was constantly "juggling" grants – a metaphor also employed

by other scientists in a separate study (Robinson, 2009) – to maintain the livelihoods of those whom she employed. She also allowed her global identity to remain intact as positive and cohesive regardless of what happened in her professional life. In this way, one could almost view Beatrice’s negative identity work as *preventive* identity work; she was making the separation between her identities and seeing herself as set apart from the traditional role of scientist so that her global identity was not disrupted by anything unsettling that might occur at work.

6.2.2 Other examples of negative identity work

Charles, Karen, and Terry were also engaged to some extent in negative identity work that resembled aspects of Beatrice’s. Karen and Terry both stated that they viewed their work as a job rather than as defining them. Karen was aware of making a clear distinction between her personal and professional lives, and recounted the experience that made the importance of this separation clear for her:

When I graduated from [graduate school], I went and spent the summer in Italy, taking an Italian immersion course, and I had the opportunity to live with an Italian girl. So, with that, you know, she kind of took me to her everyday life. I would notice that she would work, and then it seemed to me like when she would stop working, that’s really when her life began, that her life was really characterized by her family and her friends, and socializing, and that kind of thing. And I really appreciated that. And I thought that was very different than a lot of what I had been surrounded by. Here in the U.S., I think people do have a tendency to define themselves by the work that they do. And that really is what characterizes [them]. ... I want to be very good at what I do, and so when I work,

I work hard and I try to work very efficiently. But that's not, you know, it's kind of a means to an end, type of thing.

Asked about her identity, Karen found greater identification in her family, friends and spirituality; she had made an effort to position her social identity above her professional identity in the identity hierarchy. However, she said that she finds the separation between work and life difficult:

I find myself at night, before I fall asleep, thinking about a lot of my research projects and things.

The tactics she employed are similar to Kreiner, Hollensbe and Sheep's (2006) "enacting ephemeral roles" (p. 1044). She made an effort to participate in activities that were not related to her research, such as taking care of her children. This, however, created a second identity-related problem for her:

I also think that it's very easy for me to be so consumed with trying to raise [my children], and be a good mom, especially as I work full-time. [With the result] that it's easy to kind of just be one or the other, and you kind of lose that identity.

By seeking to enact one particular "ephemeral role," Karen found that she then over-identified with her maternal identity. Her professional and mother identities together were so greedy that she easily lost herself, her personal identity, in these other two roles. To prevent this, she tried to participate in activities that focused on her, such as learning languages and dancing, but said it was difficult to find time to do so.

Karen's identity work appeared to be motivated by a desire to be authentic to her whole self, rather than just her professional self. Terry described a similar motivation, identifying with a number of other important roles:

At the end of the day, I would like to be defined by many other things in addition to being a scientist. I'm going to be defined by being a great dad, by being a soccer coach, by having a lot of friends. And by being a scientist – by mentoring, by teaching, it's a lot of different things.

In discussing his other roles, Terry also expanded on his role as an academic scientist. He later stated how much he enjoyed the parts of his job that were not research, as well as loving his research. His ability to see the many parts of academic science in addition to research was perhaps related to the fact that he was highly funded and thus felt less pressure to seek funding. However, he also articulated his desire to enact multiple roles outside his current professional environment. He was emphatic that being a scientist did not define him:

I try not to make it something that I am. I am a lot of other things besides being a scientist. At least, I try to be. It's something that I do, but I make the most of it, and I enjoy it ... and I try to look for other things. So it's definitely something that I do. Because it's not the whole thing. If I need to go and do something else, I will do it. I would love to, at some point, explore possibilities of becoming a writer, or an actor, or a journalist. So it's definitely something that I do. But I do it passionately, I love it.

Similar to Beatrice, Terry appeared to be performing preventive negative identity work. If a time should come when he would have to stop leading a research group, he said it would be easy to switch to another field and pursue it with passion.

The fourth participant who engaged in the negative identity work of separating his work and professional lives was Charles. He said he has always been good at making this distinction, except during the pressure of graduate school:

I need that division between my personal time and my work time. ... It's partially my personality to be able to, without too much thought, compartmentalize my life.

Without this separation, when "those lines get blurred, it's actually disconcerting." Charles had become aware of his need to separate his identities because his wife, also a scientist, did not experience this herself. She liked to come home and discuss experiments:

Sometimes it's hard for me because, you know, it's like, 'Oh this is my time, you know, away from work.' And that's sometimes kind of hard. So of course I talk to her about it, but sometimes it makes it a little bit, you know, just a little bit frustrating to me that, okay, now, here I am, when I normally have my time away from the lab, and I'm talking about work. So that's hard sometimes for me.

From Charles' statement above, I infer that separation allowed Charles some time to relax and recuperate from the pressures of work. His wife's desire to discuss work was stressful because it served as a reminder of what he was trying to put out of his mind so he could relax.

Charles' identity work was similar to "flipping the on/off" switch identified by Kreiner, Hollensbe, and Sheep (2006). He was aware of his multiple roles and could easily negotiate their boundaries to keep them separate. The merger of the two, however, was disconcerting for him. During graduate school, when he found the on/off switch more like a dimmer switch than one that could be flipped, he found it helpful that he had a young family. The alternate, and pressing, role of father provided other activities that helped dim his work identity at the end of a day and brighten his personal identity.

The four faculty performing negative identity work used multiple tactics and motivations. The one tactic of "differentiation" that Kreiner, Hollensbe, and Sheep (2006) describe that I have not yet mentioned in relation to these faculty is that of setting limits ("to acknowledge one's

capacity to perform the occupational demands”, p. 1044). While some participants clearly stated that they were working their hardest and it would have to be enough, this did not appear to be a form of identity work. Instead, setting limits could be related to the preventive identity work exhibited by Terry and Beatrice – it reduces the pressure to succeed that individuals may feel if something is difficult to achieve or goes wrong professionally.

Family served as important aids for these four faculty in their negative identity work, helping to keep their work lives in perspective and prevent professional identities from encroaching on personal identities. The next type of identity work, positive identity work, has an exemplar where the opposite is true – family, particularly children, allow the entanglement of identities, but the intertwining helps those engaged in this type of identity work perform better.

6.3 POSITIVE IDENTITY WORK

Earlier in this chapter, I showed that many participants had a dominant professional identity as an academic scientist (table 7). Of the fourteen participants who were not conducting negative identity work, twelve said that being a scientist defined them – they had merged their role and their identity and they saw little distinction between their functional and ontological states. This is seen by Kreiner, Hollensbe and Sheep (2006) as an integration tactic, part of the repertoire of positive identity work I described in chapter 2. The personal and professional identities of many faculty were integrated to the point where the scientists were defined by their work, often due to the large amount of time they spend training for this position and working. Even Terry, who clearly stated he had multiple roles, had experienced this:

During my PhD and my postdoc it was almost like my only role. And I was probably a little bit defined by that, because of really the time and the effort that I had to put into it.

Therefore for many – even those conducting negative identity work – this integration of role and identity appears to be the *status quo* for academic scientists. I therefore concentrate here not on the fact that integration occurs, but on the case of Isobel, exploring *how* she integrated her personal and professional identities, and where her role as mother fits into this complex intermingling of identities.

6.3.1 Isobel's story

Kreiner, Hollensbe, and Sheep (2006) present an integration tactic called “infusing self-aspects into tasks” (p. 1044), whereby people incorporate their identities and personalities into their work tasks. Isobel's identity work resembled this, but was the reverse – instead of incorporating her personal identity into her professional identity, she infused her personal identity with elements of her professional identity. She found self-definition in her work and translated that into her personal life:

Because of the type of things that I do, I have to be very organized. I use the same set of skills when I'm at home. ... I have things put in the same place, and I have racks in the garage to store extra things, just like my laboratory supplies. ... I try to be efficient. I developed a system to run my lab, so I kind of translate that somewhat into my life too. So when I try to organize an event, you know, even for kids – I always have sort of a checklist with a couple of things I need to do

three weeks before, a week before. I tend to be more procedure-run than average people.

It could be that it is the strong organizational element of Isobel's personality that drew her to scientific research, where one must follow protocols and be organized in one's approach to experiments. It would then be natural for her to adopt this approach to life. However, subsequent comments made it clear that her professional identity is reflective of the tasks inherent in her job. If she were to change jobs, despite maintaining what she saw as the characteristic of scientists (organizational skill and logicity of thought), she would no longer think of herself as a scientist:

The traits of being a scientist will go over wherever you go. But that identity more or less comes from the type of work that you do. That's how I would like to define that. But again, it can change, right?

She then pointed out that she considered a senior administrator as such, rather than as a scientist, and clarified how she sees job function, professional identity and global identity fitting together:

I think a scientist is always part of one's identity, but later on, depending on your job, then your identity might get defined more by your job rather than being the type of person you are.

In essence, Isobel's professional identity reflected her job title and role more than her skill set or sense of self. Since she fused her professional, and personal identities, her global identity eventually matched the tasks she performed at work.

This is a complex integrative feat personally, yet it did not end here. Isobel has another dominant role to add into the equation – that of mother. She identified equally with the roles of mother and scientist, but this was a difficult balance to maintain:

I agonize over those things from time to time. So there are times when I have to be at home 'cos schools were cancelled, and I have a grant that's due or a review is due. It is really hard.

While this description appears to separate the mother and scientist roles, she clearly stated several times that she was content to let the identities of mother and scientist merge, and that they frequently did.

The merging of identities, however, might be out of necessity to enact the two roles, rather than a chosen integration. They merge because, she said, "I think often I have to do both." This, therefore, is distinct from how she integrated her approach to work into her life, which she did naturally to make her home life more organized. She described performing two roles simultaneously, "juggling" being a mother with an intense and demanding job. In considering the role that science plays in her life, she said:

I think it's mostly been my life for a long time. But now I'm a mother, so it can't be my life 'cos I have the other things that I have to take care of.

In contrast to the vertical hierarchies of negative identity work, Isobel had a horizontal repertoire of identities that demanded simultaneous attention and that had to be balanced.

6.3.2 Other examples of positive identity work

Rebecca has also experienced the pull of distinct, but equal, identities, although for her the tension is between her role as a teacher and a researcher. She began her career immediately after earning her PhD in a pedagogical role. Over time, she became more active in research. Reflecting on this, she said,

I've migrated now from a teacher to a researcher. And I think both are very important now. I've found that you have to integrate the two. And that's what makes or breaks academic institutions. I think if you have more people who are very well integrating their research in their teaching, you have excellence in the community. ... In a graduate school I think you need to integrate research with teaching because students really learn most when they do something. They solve a problem, and they do hands-on learning, so active learning.

The tension between the role of teacher and researcher for Rebecca was a result of the institutional culture of the medical school, which she said prioritizes research. Prior to being able to integrate her two roles, Rebecca learned that "you get no credit" for teaching and teaching-related work, such as serving on a curriculum committee. This prompted a re-evaluation of her professional goals:

After some time you begin to think that, you know, since it's really research, and that's what it's after, I'd better spend more and more time on doing research. And they give you dollars, money through your grants to buy out your time and to make sure you're doing research. And once you start doing research, and you start enjoying it, I think then teaching kind of becomes actually an *impediment* sometimes. Because you have to be there, you have to do this, but at the same time you have deadlines for grant submissions and so on. And it becomes very difficult to mix and match the two. So you must have a game plan. You know, how are you going to do this class, and how you are going to do [it all]?

The tactic Rebecca used to integrate her passion for teaching and her identity as a researcher was to focus more on mentoring students and postdoctoral fellows individually. This fed her need to

teach and promote active learning, and yet also resulted in data and the potential for new knowledge creation.

In this sense, Rebecca has reframed her understanding of teaching to integrate it better with her other professional role. This positive identity work is also an example of professional identity work, which is examined next.

6.4 PROFESSIONAL IDENTITY WORK

I have not come across a construct called professional identity work in the identity work literature. In the literature surrounding graduate student socialization and the formation of academic careers, Weidman, Twale, and Stein (2001) discuss the anticipatory socialization of graduate students to professional roles, and how a variety of socializing factors can help young academics develop dispositions to perform professional roles. Much of the identity work literature uses professional settings as the basis for investigation, but focuses on identity work that affects individuals' global identities. I have found little research grouping together identity work relating specifically to maintaining a positive and coherent sense of *professional self*, other a study by than Pratt, Rockmann, and Kauffman (2000). During interviews, however there were multiple clear examples of faculty reframing their understanding of their positions or the nature of their work to reconcile some identity inconsistency. For many, the inconsistency occurred when, as discussed in relation to research question two, the nature of life as an academic scientist did not mesh with their expectations. As with negative and positive identity work, one participant in particular, Peter, was able to articulate his experience of consciously undergoing professional

identity work. I recount his experiences first, before turning to other types of professional identity work.

6.4.1 Peter's story

I described earlier the inconsistency Peter saw between his notion of the “ideal prof” and the way in which he had to perform his job to win approval of colleagues and funding agencies. He felt it was important to focus on research that benefits patients – a holistic view of his field – instead of research at the molecular level. However, the latter was the widely accepted approach to his field, which he saw as an inefficient use of research dollars and time. Because Peter did not feel able to enact his notion of the “ideal prof,” his work became less meaningful to him, making it a job rather than his passion. Meaningfulness for Peter was derived strongly from the people for whom he worked – patients. By removing the ability to focus on patients, the current norms surrounding the approach to his field reduced the meaningfulness of work:

I should be influencing people, as I said earlier. I should be producing new data that will convince people that there is something new to incorporate into their model of [disease] that will, in some near future, lead to improved patient care. If I don't do that, I think that I will have failed in who I am, and what my goals are. But if that fails, so, I can still fail at that, at being the idealistic professor, and still have the job and do the job, and probably do it for decades. So who I am and who I'd like to be even more of is that idealistic prof who is devoted to the science, devoted to the cause, and works for the good of the patient. And I hope that happens [laughs]! But these days I honestly feel that being a scientist is what I do.

It's just, you know, you come to work and press the keyboard and fill in all paperwork you need to fill in and off you go.

Peter, like all participants, was approaching the tenure decision. He felt strongly the need to “make sure the CV is well rounded for all the things that tenure committees look for,” by conducting academically “well-designed experiments” that could lead to publishable data but which he felt would not have an impact on patient care. This was a frustrating exercise for him, because “none of that really matters compared to what the ideal professor does.”

Although Peter had previously “resigned [himself] to having to do that kind of science for a while,” he was reconsidering his previous decision to participate in a scientific community that was at odds with his fundamental belief about the work:

So now I'm sort of taking stock again, and saying, “Well, is that really making me happy to do that?” And the answer is no, of course. So I'll keep doing those ‘well-designed’ experiments, but now is the time, and opportunities have come up around me, to develop again the idealistic goals that I had from the beginning. Which are to make people think about, if they produce some data, are they truly producing something valuable for the patient?

To gain validity among his peers, Peter knew he had to be seen to be successful in the current system before he could hope to change it by making people consider deeply whether their research is responsible and ethical, by which he meant in the interest of patients. He saw the current state of his field as “splintered” and in need of repair; so too was his professional identity, which had been torn apart by this academic distance between his ideal and the reality. At the time of the interview, Peter was acutely aware of his need to reduce the distance between the two, and was therefore actively engaged in identity work and able to talk about it:

This is actually, by chance, a very critical time for me, where I'm now making the efforts to bring these two opposing behaviors back together.

Being in the midst of this internal struggle was “definitely very uncomfortable, ‘cos you’re always questioning what you *should* be doing.”

I asked Peter about how he managed the stress of his current situation, which had been ongoing for some time, but which he ignored in his earlier years at this institution because he was setting up his laboratory. He had been tempted, on occasion, to leave science:

I've been at many points about to throw in the towel. And even though I'm funded, it just didn't seem worth it really. It didn't seem worth it because I couldn't be the scientist who I think I am in my close environment.

He continued to discuss the extreme options he has considered to remove himself from the situation before saying this:

So that's where being the scientist is not simply what you do anymore, right? It's who you are. So if you can't be who you are, then who the heck you gonna be? You know, there's no one else to be. So that's when at some point you have to say, “Well, okay, how can I just *do* the scientist for now?” and not worry so much about *being* the ideal scientist.

This powerful quotation sums up identity work for Peter and others – if you cannot be yourself, who are you? What is your identity if that which you know is not available to you, for whatever reason?

Peter's way of dealing with these difficult questions was, to some extent, to put them aside when they became too unsettling. Instead of pondering them, he could adopt the institutionally provided role of academic scientist, falling into its patterns of daily behavior as a means to cope. This crutch through the troubling period is similar to “splinting” by radiology

residents, who used their prior student identity to “[bolster] the weakly defined radiologist identity by providing residents with a temporary identity to use until the radiologist identity developed and became stronger” (Pratt, Rockmann, & Kaufmann, 2006). He accepted, however, that using the institutional role of academic scientist to “splint” his identity could not be a long-term solution. He found the lack of his own, authentic professional identity as a scientist troubling:

If you don't have that, what the heck's keeping it all together? ... You know, there's nothing else. If you don't have that identity, then what the heck is going to put it together? And it's not enough to just say it's a career. I honestly- I bet you most people do not say they're just doing a career. Is there anyone? [laughs]

There's very few, I'm sure.

For the meantime, however, Peter realized that if he were to continue in science, he needed to find a way to accept the idea of doing research as a job, and to feel positive about himself in doing so. He had been helped by colleagues who enabled him to see that he had been successful already just by reaching this position:

Ultimately you need people around you to remind you that just being the scientist who goes to work and gets paid and looks great on paper, or good enough on paper, is fine. There's nothing wrong with that. ... Maybe I can't be the hotshot, the idealistic prof, right? The one who changes the world. But look at what I am already. I mean, I've got an office, a laboratory, whatever else, so that should be good enough, right?

Peter used the prop of a successful academic scientist in the same way that research administrators surrounded themselves with academic material to lessen the faculty/staff divide (Collinson, 2007). Doing so was an attempt to make public his status and socially-accepted

accoutrements of success in this particular environment, thereby boosting his own self-confidence. This perspective helped Peter regain a positive sense of self that was, at least, coherent with the socially-driven role of academic scientist. In using this as a reconciliation tactic, he was not repairing the splintered identity, but learning instead to live with the difference, perhaps setting it aside until he can work on it without a looming tenure decision. Here Peter moved from professional identity work into coping identity work.

Peter's experiences offer a rich description of somebody currently in the midst of professional identity work. He articulated the trigger – a disconnect between how he thought research should be done and the reality – and he shared what that meant to him and how he coped with it. Because Peter was in the midst of identity work, it is difficult to see the exact form or tactics. However, it appears he wanted to refocus his professional efforts to take a different approach to the same problems. Other faculty members described in less detail, and with less awareness, different types of identity work.

6.4.2 Other examples of professional identity work

Three other types of professional identity work were conducted by participants. The first was a reframing of how one views the nature of professional work. The second was a reconceptualization of the professional self. The third was an alteration of the relationship of self to work, or one's perspective on the personal meaning of one's career.

6.4.2.1 Reframing the nature of professional work

This type of professional identity work was displayed by Daniel. As described earlier, Daniel saw a difference between how scientists should be and what they are in the reality of the

institutional context. He bemoaned the need to “add to the same snowball” of data, pursuing the same problems in the same manner as other scientists because that is expected. In Daniel’s recent past there was a period where he was seriously considering leaving the university. At that time he thought long and hard about what he would do, eventually determining that a scientific job in industry would suit him. Although he could not imagine being in academia without being an independent researcher, he said he could be content in industry, even though it would mean a loss of academic freedom, because he would at least be doing what he sees as important – fundamental research. Although fundamental research is typically seen to be conducted in academia and applied research is more often the norm in industry, Daniel had a different perspective. In describing this, he said:

But then I realized that so-called applied research can actually be often more fundamental than academic research. It’s like a totally different way to classify things.

His explanation about how he realized that applied research in industry can be *more* fundamental than academic fundamental research was long and difficult for me to follow. However, more important than my comprehension of his logic here was his belief in the explanation. If Daniel left to pursue a career in industry, his belief would provide him with a way to continue work that was important to him and about which he felt positive – fundamental research. This would thus allow him to maintain a positive self-image, and perhaps even participate in “condemning his condemners” (Ashforth & Kreiner, 1999, p. 424) by belittling academic fundamental research. He would maintain self-consistency by continuing to perform similar work, in his view, albeit in a different environment. Thus, by reframing his understanding of the nature of the professional work conducted by academic and industrial scientists, Daniel would keep his professional identity intact even if he were to change sectors.

6.4.2.2 Reconceptualizing the professional self

Whereas Daniel reframed the nature of professional work and Peter wanted to reframe his approach to professional work, Sally's professional identity work was focused on her understanding of herself as a professional. Sally stated early in the interview that she felt less like a scientist and more like an *investigator* who happens to be currently investigating scientific problems. She had not intended to become a scientist, and she did not even particularly enjoy her graduate student or early postdoctoral positions. Instead, she said,

I always liked investigation. You know I wanted to be a- [laughs] like an FBI profiler! Those types of people. So investigation – I like that part. You know, it doesn't matter what [type], criminal investigation or whatever. So I think science is similar, it's just a different investigation.

Having stated her affinity for this type of work early on, Sally brought it up again later in the interview when asked if there were other jobs she would consider if she did not get tenure.

Well, I thought about it [pause] you know, maybe go back to school then join a criminal laboratory – I still want to do that [laughs]! Yeah, that's the only thing that never changed. I'm more and more clear that I want to do that. I just have that passion, I have the instinct. And if something happens, you know like an accident when I am with my daughter, I say, "Look at this, look at that," you know, do profiling, that sort of thing. I just have that kind of instinct. I like to do those things.

Sally appeared to have no qualms in leaving academic science as it might allow her to pursue her longtime dream of becoming a criminal investigator. Her sentence, "that's the only thing that never changed," is the crux of Sally's professional identity work. If she were to leave academic science, her professional identity would remain intact because she would continue to be an

investigator. The only things that would change would be the problems under investigation and her environment. She therefore had not experienced the identity destabilization or splintering that can provoke other identity work, and has kept her positive, coherent sense of self.

6.4.2.3 Renegotiating the relationship of self to professional work

The third type of professional identity work was conducted and completed by Rebecca in the three to six months prior to our interview. Rebecca started her career motivated to teach, but engaged in more and more research, eventually integrating her identities as teacher and researcher. She was awarded an NIH grant earlier in her career, but had trouble getting an R01. Reflecting on this, she said,

I think the biggest stumbling block is figuring out how the system works at NIH.

That took me a lot longer.

She had no start-up funds on which to rely, and few mentors to guide her, having completed her doctorate in a different discipline and having had no postdoctoral training. When Rebecca had experienced repeated rejections for her grant applications, she wanted to visit NIH to see how things were done there. She was able to do so when invited to become a reviewer on a study section. This opportunity gave her a significantly greater understanding of how the peer review system worked, and helped her not take rejections personally (a theme that emerged from other research with more experienced scientists; Robinson, 2009). Nevertheless, she reached the point where she was engaging in serious questions regarding her future in academic science:

I've considered many times giving it up because it would many times get to the point where it's wrecking my home life. And continues to wreck my home life.

However, she had not left academia because of her recent change in perspective regarding what her work means to her. In discussing this, Rebecca commented:

I feel like I really, in one year, sort of transformed myself. Because I think very differently than I did a year ago, when I wrote my first R01.

By this, she later clarified, she meant that she has transformed her relationship with work and the importance of professional success to her global identity.

Whereas previously she saw professional success as the ultimate goal, she has transitioned to seeing the funding and tenure process more as a game. Although skill and perseverance are required and there is an element of chance, ultimately the consequences of losing have become less influential on her overall well-being than she had previously thought. The realization discussed in relation to research question one, that tenure was meaningless, helped Rebecca reach her new perspective:

Whether I get tenure or don't get tenure, it doesn't matter. I think that made a big difference.

Before her transformation, Rebecca thought her career would be over if she did not get her grant funded, and she worked constantly. After this change she began giving herself more time, trying to create more of a personal-professional balance in her life. She has become more confident, relaxed, and out-going, she said. The reduction of pressure she felt by seeing tenure and funding as a game appeared to have revived her professional spirit:

I realized that the stakes [for tenure] are not that high. Nothing's going to change.

I just am going to play it my best, that's it. And that took a lot of pressure off me.

And I didn't realize it for so long. I was just too naïve.

I asked Rebecca how she engineered this transformation, or what specifically changed.

She responded:

I think it is just the perspective, I mean somehow that one year, right? I think that failures make you do that. Because I failed in something I was highly confident about.

By caring less about the consequences for her career, she felt able to discuss difficult issues with members of her department and seek more advice – both things that have helped her professionally but that she felt unable to do before. When I sought clarification regarding how she changed her perspective after her grant application failures, Rebecca gave a rich, lengthy description of many of the changes she underwent. Here is a condensed version of the most significant changes in her professional approach and perspective:

G: How did you get to that [transformation]?

R: That I don't know. I think it's just a lot of internalizing. I don't think you get to it without any other, you know, it's really like asking how do you cut through this barrier? There was a barrier, an artificial barrier, introduced by me, right? Because of my own thinking. That this is how it should go, that's how it should go. And when people give you feedback, I think the main thing is how do you react to feedback that people give you? That's where I changed. I used to be very defensive in the past. ... Now I don't do that. I actually listen to people. I think there's a huge difference. ... I used to be very scared to ask for input, for many reasons. I would think, "Oh, what if they steal my idea? What if they do this?" Now I have figured out how to go around that. Something else that prompted me, or that I was really thinking seriously about [was] what would a career change mean for me? Because I had to make this decision: what happens if they don't give me tenure here? ... So basically what prompted me was [that] I opened up a lot. [Practical considerations of changing careers] are all manageable, you know?

I think what's not manageable is your own psyche. Like if you have pressure, ... normal workplace pressures, the question really is how do you react to that? And I think that, if you can learn how to do that early enough, I think it would help a lot of people to navigate the system faster.

Critical to Rebecca's transformation was recognizing that even if things do not occur exactly as she had planned, she would still be able to continue life with a positive self-image. She opened herself to the possibility of failure, having experienced it in the grant funding arena once. She accepted and valued feedback and instead of having a damaged professional identity, she grew stronger. By lessening the negative consequences of her career not progressing in her intended manner, Rebecca learned to manage her own negative self-talk or fear of negative feedback. Returning to a sensemaking element, she acted upon her environment to remove self-imposed barriers. The major turning points of her career, such as tenure, became a game instead of the determining factor of her satisfaction and confidence. In doing so, she also recognized that she would be valuable elsewhere in academia if this position did not work out for her. In summary, her professional identity work of changing what her career meant to her allowed her to reduce the pressure to perform and move through her fear of failure into a more confident, positive perspective.

Rebecca's change in perspective was striking, even for her. She had already completed her identity work, which allowed her to talk at length about it. Victoria had not yet experienced a trigger strong enough to provoke identity work. However, in discussing how she felt about the change in the NIH economy since 2003, Victoria had made comments that suggested she would conduct professional identity work similar to Rebecca's. Victoria had already changed career paths once, after she was not one of the 10% to be chosen to continue in medical school in an extremely competitive academic environment. That experience appeared to have given her the

perspective that enforced change could improve her situation, since she was confident that she was happier doing research than she would have been as a medical doctor. Regarding having to move into industry if she were not able to secure funding, she said:

If I fail to get funding then I [would] switch to private company. That's what I would have thought before. Now I would think about it like it's a new chapter in the book and it's going to be also interesting. And it's not because I've failed, it's because it's hard economically, I mean, I believe I'm doing not too bad science, I think. We're doing some interesting things but, you know, there are more competitive people than me. Well, I'll get into something else, and be better at that. It wouldn't be like, "Oh, it's just plan B because I failed."

This change in perspective regarding her career helped Victoria cope with the possibility of having to leave her position. Similar to Rebecca, she felt reduced pressure because the consequences of not "succeeding" (i.e., getting funding) were not as severe as she had once thought. If her current position did not work out, Victoria planned to seek new opportunities elsewhere and make something positive out of it. She therefore would retain her positive professional identity and sense of self by viewing a failure in funding as beyond her control. She has reframed her understanding of a central part of her professional life, funding, in the same way that Rebecca did with tenure.

6.4.3 Summary

The three different types of professional identity work described here were all conducted by lower-funded faculty. They retained self-coherence and positivity by restructuring and reframing their concepts of what constitutes professional work, themselves as professionals, and

the consequences of professional pressures. In addition, I have described a current episode of identity work: Peter attempting to rejoin a splintered profession and his own splintered expectations and sense of self. For the faculty described in this section, however, there were some situations that could not be fixed immediately. At the time of interview, Peter in particular needed to find a way to cope with his current internal struggle when reconciliation was not imminent. At such times, coping identity work may be the only available option to individuals. This is the fourth, and final, type of identity work.

6.5 COPING IDENTITY WORK

When somebody faces a situation that cannot be changed, in some cases the only option available is for the individual to reconcile him- or herself to the new situation and find a way to cope with it. One method employed by two lower-funded faculty participants, Peter and Jonathan, was to accept that their position would become, perhaps temporarily, a job rather than their passion and/or identity.

Peter's use of the widely accepted role of academic scientist as a supporting identity when his own identity was splintered is one way of coping. This was not a role in which he felt comfortable, but it provided him with a means of continuing in his position until he could reconcile the difference between his desired professional identity and the institutionally accepted version thereof. It allowed him not to have to find a new position or face financial problems if he were to leave his current employment. I inferred from Peter's remarks that he envisaged a long path to becoming his "ideal prof," and that during this period he would borrow the role of "ridiculous prof."

So yes, you do have to take stock and put things in perspective for a little bit. See if you *can* be that ideal prof again. If not, you know, ultimately I'm going to resign to just being the ridiculous prof who just comes to work and gets paid. I mean, there's thousands of profs ... that do that every day. It's not a problem. And I will do that. But I'm still trying to hold onto that ideal prof.

Although there were institutional repercussions of acting the role of "ridiculous prof" in that it might lead to reduced productivity, it could be beneficial for a short period to help people like Peter reconcile themselves with their current environment and internal struggles.

Jonathan expressed a similar sentiment to Peter's. Whereas at first he described a strong professional identity as a scientist, he subsequently reconsidered the question and remarked:

I cannot say [that I think of] myself as a scientist all the time. It depends on the situation. If the situation is tough, rather than a scientist, I just work, you know, kind of to survive in a survival game.

By seeing work as a survival game rather than as science, Jonathan reframed his relationship to professional work. It is something that has to be done to maintain personal financial security. He therefore was doing what he has to, temporarily, until he can look beyond survival to success.

The permanent adoption of the academic scientist role that felt inauthentic may have allowed Peter and Jonathan to continue working but was unlikely to make them content. Nicola, on the other hand, gave the impression that she would be less troubled by it. Nicola was highly funded and had worked outside academia before. She was also place-bound for personal reasons. When I asked her if she was worried about her chances for tenure, she replied:

I guess worried is too big a word. But I have thought of it. You know, what if I don't get tenure? Uh [long pause] I don't know. Maybe I would just try to go work.

Nicola sees research and “just ... work” as very different activities, although even ‘work,’ she said, was preferable to continuing in her current position but off the tenure stream (which would feel like “going down”) or returning to her previous place of employment, where she was also engaged in research. Given that these two alternatives would be more likely to allow her a continued professional identity as an academic scientist, I inferred that finding a job that was “work” rather than her passion would not challenge her professional identity. Perhaps the reasons for this were her highly funded status or her considerable professional experience outside academia. She had been socially validated as successful and therefore has had some experience in the institutional role of academic scientist. To adopt another institutional role might therefore be less of an unknown and unsettling experience for her.

Similarly, Victoria, in opening herself to the possibility of working in industry, was performing coping identity work prior to the time when she might actually need to engage in it. She was laying the groundwork that her career would not be over if she were to leave her current position. Instead, it would be a new challenge, demonstrated in an earlier quotation. This is contrary to her view when she first arrived in academia:

I mean, if I don't get any funding, and if I have- I mean, I will need to think about private companies. Right now I don't have any clear plans, but, you know, when I arrived here, it was, ‘Oh, well, I'm only going to do academia. Research, nothing else. Never, ever in a private company.’ Now I'm thinking like, why not? And [I'm thinking] about what it means to be in a private company and which kinds of positions I think I could have. Which kind of company I could think about applying to, if I have to. Would I think about moving to another place? You know, or so, yes, I mean, I'm open to those considerations.

By following this line of thinking, Victoria identified paths of action that would not violate her professional identity. There appears to be an element of self-persuasion here, in that her possible path is one that previously she would have rejected. By working on accepting this new potential career path, however, she is reducing the likelihood of identity destabilization that may otherwise occur if she were forced out of her current position due to funding concerns. This, therefore, appears to be *provisional* coping identity work.

6.6 SUMMARY

In answering this third research question, I have described five types of identity work conducted by participants: professional identity formation, positive, negative, professional and coping identity work, and proposed possible examples of preventive identity work. There were multiple manifestations of each type of identity work, with some commonalities between them all, such as striving for a positive and coherent self image that fits in the institutional context as well as with the individual's identity and personal needs. Table 8 summarizes key examples of identity work described by participants in this study. In considering the cases of identity work here, there are some commonalities among the people for whom the deepest identity work has been triggered. Most participants who have conducted professional identity work have had reason to fear for their tenure chances or have experienced funding difficulties. Francis and Peter are either on, or are considering, a temporary removal from the tenure stream. Jonathan felt insecure about his position for some period. Rebecca had several rejections of her grant applications before conducting professional identity work. Those conducting positive and negative identity work sought balance and authenticity in their professional and global identities.

Table 8: Types of identity work found in this study

Type of Identity Work	Examples in this Study
Professional identity formation	Use of role models (particularly postdoctoral mentors) Self-in role enactment to define the role of “biomedical scientist”
Positive	Conscious integration of professional and personal identities Bidirectional relationship between behaviors in the work and home environments
Negative	Separation of professional and personal identities, driven by authenticity Higher social identity complexity allows for greater ease of positive sense of self
Professional	Reconceptualization of the professional self Refocus of the approach to work Reframing of the nature of professional work Renegotiation of the meaning of professional work to self
Coping	Use of commonly-accepted role as identity prop Acceptance of current situation and discovery of a moderately comfortable manner in which to work for a (possibly prolonged) period of time
Preventive	Consideration of how to cope with potential but non-imminent threat before it materializes.

Other participants have featured less strongly in relation to this research question. They were the participants who either felt confident about their positions, and/or they were comfortable in their professional identities. For example, Adam felt “pretty good” about his chances for tenure because he had strong publications and funding. Oliver, also well funded and with a strong publication record, felt confident that he would not be put up for tenure if he were not ready. Matthew, who had experienced some funding struggles but was now highly funded, was certain of his professional identity even in his most academically challenging periods. He attributed his lack of concern over his position to a combination of naivety and a supportive chair. As a brief review of these participants suggests, the triggers for identity work may be internal to the individual – part of their identity and individual needs – or external, i.e., within the departmental or institutional context. While there may be less that institutions can do about individual personality traits and degrees of identification with a professional role, there is significant room for cultural or operational change if an institution wishes to embark on such a course. This is the topic of the fourth research question.

7.0 ASPECTS OF THE INSTITUTIONAL EXPERIENCE THAT ARE RELATED TO PARTICIPANTS' SENSEMAKING AND PROFESSIONAL IDENTITIES

This chapter begins by looking at one specific element of institutional culture, viewing the institutional focus on NIH funding as a form of sensegiving. I then focus on how people and policies within the School of Medicine can work within that culture to promote or hinder success. Areas mentioned by participants include the role of chairs, how mentorship can help or hinder, tenure expectations, as well as specific administrative issues experienced by a minority of participants.

7.1 INSTITUTIONAL SENSEGIVING

A common understanding among all participants was that publications and grants were fundamental to success within the medical school. This culture has been created intentionally by the school's dean, who made it his mission to improve the institution's rank in terms of NIH funding awarded. He has succeeded in this mission, rising substantially up the rankings in the past decade. In so doing, however, the school leadership has created a culture whereby success is measured by funding. There is a similarity here to Michael Pratt's (2000) observations of the Amway distributor network. Amway builds recruits' dreams by "linking one's sense of self to possessions," (p. 464) thereby creating an identity void and a culture of dissatisfaction with

recruits' current lifestyles so that they would strive for more sales within the distribution network. In a related manner, the school has given a particular meaning to being a successful academic scientist – one who has funding. Without funding it becomes difficult to maintain a positive identity as a successful academic scientist. Also similar to Amway, 'more' is never sufficient; there is a perpetual drive for more funding by the lack of certainty regarding how much is 'enough' for tenure. Since publications are an important part of securing funding because they prove the applicant has expertise in the relevant area, the result of the institutional sensegiving is that faculty feel self-imposed pressure to publish and win grants.

The focus on funding is so firmly embedded in the culture that few participants felt this as an institutional pressure, feeling it instead as a natural pressure related to what they had to do to succeed. In response to the question, "What pressures have you felt from the institution with regards to coming up for tenure?" many participants expressed sentiments similar to Karen, who said,

I have to say that the pressures that I feel are self-imposed ... Because of the encouraging and very supportive environment that I'm in, I think I want to do well, and I want to achieve those benchmarks, and those benchmarks are definitely outlined, but I wouldn't say that I feel pressure from the institution.

The sensegiving, by providing what Karen sees as clear "benchmarks" to achieve, had been so thorough that Karen did not question whether these achievements were what she wanted or were suitable for her. Rather, she pursued them with determination and drive. Peter echoed this with:

My department's pretty friendly. The pressure they apply is really just in- they frame it in terms of this is what you need to satisfy the tenure review committee.
... I get [the pressure] from myself.

Oliver commented that since he enjoyed his job, the self-imposed pressure to succeed was easier to cope with. Similarly, Sally stated:

I can take it if the pressure is just somebody pushing you in a positive way. You know, they just want you to do well.

This is in contrast to pressure from a mentor whom she perceived as having bullied her.

In Victoria's case, the institutional sensegiving had been successful enough that she strove to achieve the culturally accepted notion of success because she felt loyal to those who have helped her along that path, similar to Pratt's (2000) observation of some new Amway recruits and their relationships with their "upline" members (mentors). Victoria stated that she felt no pressure from the institution, and described her motivation for being successful in the following manner:

I want to show that I'm able to succeed as they do, and I admire them. They are my, you know, role models and I want to be like them.

Although it was clear that the culture created through sensegiving is firmly rooted, it was difficult for me to understand how the story of only feeling self-imposed pressure could be maintained by faculty who were sanctioned for not bringing in funding. Matthew provided an example:

Even though there were definitely stressful conversations, phone calls, those are acute. They're 10 minutes at a time, and they're only once a year. You could legitimately disappear, and not do anything, right? And no one would know. You're still getting paid, you know, all these things are still happening. You have to have it in your own head. And that's what I tried to do. Now it didn't freak me out so much, because I felt I was on the right track, you know? And again, it comes down to, you know, I can only do so much. ... And I probably work more

than I should have. Certainly more than I'm paid to do. But I don't ever think about that. I don't do this because I'm getting paid. I just feel lucky, "Hey, I get paid for doing this?" It's great! So I just put the pressure on myself to do this.

Although there were periods when Matthew's chair had berated him for not having grants, he discounted them because they were finite, short, and infrequent – in other words, easy for him to ignore. The rest of the year he felt he was left on his own to perform well, and that it was he, not his chair, who drove this performance. His self-imposed pressure was both acceptable and sustainable because he enjoyed his work and had confidence in his scientific pursuits. This allowed him to maintain the sense that he derived from the institutional culture.

Although most faculty did not express concerns regarding this culture. Adam did. He described how he had been surprised when he received his offer letter, after a verbal job offer had been made, to see that his appointment was only for one year, and that he was expected to fund 100% of his salary on grants within three years. Reflecting on this, he said:

That was the first time where I started to question, and continue to question, the institutional commitment. Because in my mind, they have nothing to lose, right? It doesn't cost them anything for me to be here. And, so, anyway, that was a bit of a shocker.

In Adam's case, the focus on funding was manifest in an offer for a tenure track job that could easily be taken away, via non-renewal, and where having funding is not a matter of being successful but of livelihood. Adam said he had made a point to rationalize this situation by thinking:

If I don't have grants I can't do anything anyway, so if I have grants, I'll be able to pay my own salary. So I just have to keep getting grants.

Pressure to succeed scientifically, Adam said, was “independent of the institution,” and at least if he answered to the institutional culture by successfully applying for grants, he would have the means to be productive. However, for him the sensegiving had failed because it provided “unneeded pressure [and] uncertainty of whether or not the university has my back.” He continued:

I don't feel like they need to hang the salary thing over my head because I know what I need to do to do my job successfully. Them threatening to pull the rug out from under me isn't going to make me work any harder really. So yeah, I think there's a general lack of confidence in the institutional support.

From the above, it is clear that the institutional sensegiving is widely successful, but when taken to extremes can become damaging. A clear display of a lack of institutional commitment to a faculty member is likely to result, reciprocally, in reduced faculty commitment to the institution. This could have negative implications for institutional vitality.

The faculty participants in this study understood that funding is a key component of success in this environment, and that funding is an integral part of the tenure decision. Less clear for them, and also demonstrated in a number of other studies (Brown, 2002; Gaff, 2002; Mullen & Forbes, 2000), is the exact nature of tenure expectations.

7.2 INSTITUTIONAL EXPECTATIONS FOR TENURE

A number of participants expressed a lack of clarity regarding what they would need to achieve to be awarded tenure. While all acknowledged the aforementioned publications and grants as requirements, there were wide-ranging notions of how much funding or how many publications

would be necessary. Many admitted that there could be no steadfast rule in this regard, but wished that they had more guidance.

Beatrice said that until she saw the form specifically used in the medical school to report various criteria (e.g., funding, publications, teaching, service), the process “was just a mystery – I didn’t really know – it was all a leak here, a piece there, a piece here.” Luke and Sally described their view of moving through the tenure process more colorfully. Luke said:

There are so many missing parts, you know. I mean, you are required to do all this stuff, but ... it’s like they give you a little flashlight to do your research, but you have the entire, I don’t know, New Orleans dome to cover with that flashlight!

Sally described herself as a “free radical” within the institution, suggesting that she earlier had felt like she was bouncing around with little guidance or sense of belonging, which she contrasted with her newer ability to “picture” herself fitting in. Oliver “had to dig up” a lot of information about tenure requirements himself, and, along with many others, felt that some information provided to him earlier would have made his years on the tenure track easier.

The perceived lack of clarity regarding tenure expectations influences sensemaking and professional identities because it leads to significant questioning. For example, Adam expressed confusion regarding the specific level of funding that was expected, or necessary, for tenure:

I don’t know [if there is] an absolute threshold in terms of dollars, or indirects, or grant numbers. Two R01s, you know, but R01s can range from a couple million dollars down to a couple hundred thousand dollars. So is it the dollar value, or is it the fact that you competed? Because in principle they use that benchmark to show that you can compete on a national level with your peers. So is it okay to write a couple of small R01s to meet your quota, or do they need to be real meaty, juicy R01s to fill the bank?

Such questioning can lead to a lack of confidence in one's tenure prospects, dissatisfaction with the institutional culture, concern over future prospects, or many other psychologically difficult experiences. Any of these, either singly or in combination, could become a trigger for identity work. If professional identities are destabilized through this questioning, or the lack of certainty does not allow the individual to form a clear professional identity within the institutional environment, sensemaking may become difficult because of identity's fundamental role therein.

In contrast to the above experiences, a smaller group of faculty felt that tenure expectations were explicit. Several faculty described their understanding of what they had to achieve for tenure. These descriptions differed greatly regarding levels of teaching, service, funding, and publications, even among faculty in similar fields. The lack of congruity, however, is less important than the reduction of uncertainty these faculty experienced by feeling confident that they understood what was expected of them. For most of this group, a critical component in having reached this understanding was a strong and comfortable relationship with someone who understood the tenure process well. In some cases this was a spouse who had already been granted tenure or who served on a tenure committee, but in other cases this role was filled by the department chair.

7.3 DEPARTMENT CHAIRS

Department chairs⁵ are well situated to influence faculty sensemaking and professional identities because they are simultaneously in the position of mentor, boss, and colleague (Gmelch, 2004).

⁵ For brevity's sake and to protect confidentiality, I use "chair" to mean the faculty leader of an academic group, whether it is a department, division, institute, or some other academic unit.

They can help junior faculty interpret institutional culture while also creating smaller islands of particular cultures in their departments. Through clear and regular communication with junior faculty they can remove some environmental uncertainties; similarly, by infrequent communications or by providing mixed messages to faculty, department chairs can trigger identity work or inhibit sensemaking that drives productive action.

A number of faculty commented that support from their chairs made them feel secure in their positions and future directions. Even while Matthew was experiencing difficulty in obtaining funding, he noted that “there was inherent support [from the chair], so I felt it was going to be okay.” Sally had also benefitted from knowing that her chair would not let her be hurt by her difficult relationship with a senior colleague:

I really appreciate [the help that the chair] give me, you know, I know those kinds of things will not pass [him/her]. I don't want, I don't need extra help. But I feel very happy that someone can, you know, stop those things.

Matthew's and Sally's chairs provided them with a sense of security that someone was watching out for their best interests. This allowed them to focus on conducting good science rather than being distracted by institutional politics. As noted earlier, this reduced uncertainty can help faculty maintain positive professional identities and have fewer interruptions to their daily lives that would otherwise necessitate sensemaking.

A strong relationship with a chair was described by Terry. When asked about institutional pressures, he focused instead on the opposite – support:

Pressure from the institution? Very little. Support? Yes, it was huge. Especially from my chair. This is someone that I really, really admire and [who has] been extremely supportive. But [the chair] hasn't pressured me at all. [S/He's] been supporting me all the way.

He elaborated on his relationship:

I can go into [the chair's] office whenever I want, and I can talk to [the chair] about whatever I want. That's been in a very informal [manner]. I don't have to make appointments, and we have great communication. And that has been my best, my primary, source of support.

This strong communication and informal relationship has allowed Terry to ask multiple questions of his chair and created certainty for himself so that he could proceed in a manner with which he felt comfortable. It is not possible to tell if this relationship is the foundation for his current success, or whether his approach to work, including forming solid relationships with those in senior positions, has made him successful. However, this supportive environment, whether created by him, his chair, or a combination of both, has resulted in a notable absence of difficult identity work. It may even be a contributory factor to his desire to experience the many roles of an academic scientist rather than just that of research, or it may help him feel comfortable considering other potential professional positions.

Terry's experience with his chair contrasts with a minority of other participants' stories. For example, one participant had never met individually with the department chair to discuss his/her performance. Another describes how, in his/her former department, (s)he would only see the chair during the annual review period, despite the fact that the chair's office was in physical proximity to that of the participant. This faculty member explained this situation thus:

First, [s/he's] never there, and second, when [s/he's] there [s/he] only meets with the people that work in the same field as [him/her]. That's it.

Stories like these were rare among the participants in this study, and one of the problems outlined above was not mentioned by another participant from the same department. Nevertheless, that two out of eighteen faculty described such a tenuous, almost non-existent

relationship with their chair suggests that other faculty outside this study may be in similar positions. The ramifications of a poor relationship with one's chair are multiple and beyond the scope of this dissertation. However, the first participant above was unaware of many of the details of the tenure system, and the second articulated deep dissatisfaction with his/her former department (and resultant comfort in the new department), suggesting that professional identities may be positively shaped or affected by a good relationship with one's chair, as well as the converse.

The nature of chairs' effects on professional identities of their faculty is likely to differ among individual chairs and faculty. However, one notable function of the chair that a number of participants brought up was that of career mentor. It appeared to be important for many faculty that their chair acted in this regard rather than as a scientific mentor, because it allowed the chair to focus on the bigger picture of their junior faculty members' careers rather than providing scientific advice. Working closely (scientifically) with her chair, Victoria did not have this advantage. In addition to complications of proving scientific independence to tenure committees, she said there have been negative effects because she never had a chance to discuss career questions with her chair:

I never took the time to really sit with my boss and talk about the different things, because whenever we meet, we talk about science, we talk about a lot of things.

And I never think about, you know, really talking about [tenure].

Based on these descriptions of chairs' roles, there seems to be insufficient room in professional relationships for a mentor to act as career coach and scientific advisor. If an individual is in an administratively senior position but also mentors the junior faculty member scientifically, the result for the latter may be unanswered career questions. This was the case for Victoria, who was readying herself for the possibility of moving to industry. While these roles may be best

performed by separate people, both were important, as evidenced by the number of faculty lamenting a lack of organized mentorship within the institution.

7.4 MENTORSHIP

Several participants commented that they would have liked to have had a functional formal mentoring committee to help them with scientific and daily problems. Some of these faculty commented that these programs existed but did not work, whereas others wished their department would implement one.

Despite having a strong relationship with his chair, Terry would have liked a mentoring committee of at least two people, one who was senior in the department and who had been successful, and another with similar research interests to his. He said it was natural to make mistakes as one learns to manage a laboratory, and that having such a committee, which would meet semi-annually, could help minimize these mistakes or resultant disruption to research. Isobel envisaged a small committee that would provide junior faculty members with opportunities to expand their research, as well as help them garner resources of which they may have been unaware. For Peter it was important to be able to ask the question, “how normal is this?” of someone who has successfully navigated the junior faculty years. However, he found this difficult when approaching scientist colleagues for this type of advice:

I tried to get mentoring around me, for this kind of thing, “So what’s normal?”

And sometimes you get just trite advice: “Oh, hunker down and do it.” Well that doesn’t help me. Can you give me a skill, or something, you know? Some way to change my behavior?

Peter here was describing his experiences of informal mentoring. Other faculty have contemplated or experienced formal mentoring programs and found them equally unsuccessful. Daniel entered a young department that had no mentoring program; in reflection, he regrets this. He said:

At the time I felt ‘I don’t need a mentor, I’m good enough, and I know people to ask outside of the school.’ That probably wasn’t the case, I’m realizing in retrospect.

Jonathan had a mentoring committee of three faculty, but he said it was “actually a burden rather than a help. ” Of the three faculty on his committee, one was helpful because he listened to Jonathan’s concerns. Of the other two, however, he said, “I don’t think they even know I’m their mentee.” The problem, he said, is that mentors are not free from their own pressures to succeed:

[Mentors] actually are busy people too. They also have pressure from the school. They have to get their own grants, they have to publish their papers. They don’t have enough time to take care of other people. [They become mentors just because the school wants them too]. And usually, they don’t have enough time.

Of course it depends on the people concerned.

Jonathan here summed up an important reason why formal mentorship programs may fail – a lack of prioritization on the part of mentors and mentees to make it work. Nicola had a similar experience with both sides – the mentor, and herself, the mentee – not investing sufficient effort to create a constructive and sustainable relationship.

Another participant, who had a career development award that mandated three mentors, had also experienced an unhelpful, even damaging, mentoring relationship. The one whose research was closest to that of the participant, and therefore could provide the most scientific help, had not done so, taking instead “a very hands-off approach”. In describing their

relationship further, this participant said that the mentor's advice had been "extremely superficial" and that (s)he had neglected to read grants and papers on which the mentor was a co-investigator or senior author. The faculty member thought that having not had this mentor's expert input on his/her work "has probably hurt me the most." More damaging, however, has been the advantage that the mentor took of viewing the mentee's data as part of their regular meetings:

I had some experiences where [s/he] actually took some of my data, you know, without acknowledging my participation. ... That was kind of also a learn-by-fire, you know? Because it's a person, your mentor, somebody you completely trust, and so for me, I would put everything out on the table, only to have not such a great outcome.

This outcome of an NIH-required mentoring committee cost this participant some data, which the mentor presented as his/her own. The participant sought advice from the department chair and the two other mentors on the career-development grant, who suggested (s)he take no action but also share no more data. This was an unsettling experience that disturbed the faculty member's understanding of scientific ethics.

Francis and Matthew had a similar experience, although theirs were with their chairs and other senior administrators. I include these brief stories here to portray how a lack of trust between a junior and senior faculty member or administrator can cause the junior person to question his or her place within either the institution or the profession, and therefore affect sensemaking and professional identities. Francis felt betrayed by his chair, whom he believed had not been "honest and steadfast." He acknowledged that after four years at the institution he was expected to have an R01, which he did not. However, he ascribed this to pressures that were a result of "a total loss of trust in my boss," as well as the ubiquitous financial pressures. Francis

felt that if his chair had acted in a manner he considered more appropriate and honorable, he would have been spared the professional roller-coaster he had recently experienced. One of the largest unsettling events for Francis was the gap between his expectations of how scientists should behave ethically, and the realities. The behavior of his chair, therefore, was clearly integral to this divergence.

Matthew also felt betrayed by the administration, who had signed his offer letter that said he was expected to cover a large part of his salary on grants. Crucially, he said, they did not specify if a particular type of grant was necessary. Having successfully pursued foundation support, Matthew learned that only NIH funding would be considered appropriate for a tenure decision. He saw this as an “unkept promise,” which was the original cause for his earlier funding difficulties. Matthew’s professional identity was not shaken by this experience, but I infer that this is due to his profound resilience in the face of adversity. It is plausible that other faculty may encounter significant professional identity destabilization if they perceived the institution as not having honored an important promise.

Trust has been an underlying theme in these two sections, and is critical for feeling secure in one’s position and believing that one’s interests will be considered. If present, it can contribute to a sense of community and fit within the institutional culture, the next theme raised by some participants.

7.5 SENSE OF FIT AND COMMUNITY

Participants who brought up this theme were on the extreme ends of a community continuum. They either felt a strong sense of community, or had a complete lack thereof. Oliver contributed some of his success to his very collaborative departmental environment. He noted:

Having a good community [has helped.] You can't be strong in every aspect of the research that you do. Over here, we've gotten into areas that my laboratory was never very strong in.

He then continued by describing how he drew on the knowledge of colleagues to conduct related experiments at which his laboratory was relatively inexperienced. Victoria considered herself lucky to have a small group of peers in her department who provided her with a community and helped her navigate the environment:

We are the same level, so we talk and [have lunch together] when we have time. But we try to, you know, to support [each other]. Just to talk about, 'what do you think? What are you doing?' and things like that. So it-it's been great.

These communities provided both social and scientific support, and helped faculty feel confident in their careers.

Charles has had the opposite experience from Victoria and Oliver. Charles' laboratory has been forced to move multiple times during his time in the medical school, usually resulting in being surrounded by researchers working in different fields. He thought that this had held him back in his career:

[Without that,] I think I would be further along in my career than I am now, because I felt like, for a long time, I was kind of on an island working. You know, it was me against the world.

Thus Charles had been affected by his department's lack of contiguous laboratory space, and the financial model in the medical school whereby different buildings have different rental rates, meaning that chairs seek space with lower rates and frequently move faculty out of high rent space. The constant moving and apparent lack of concern regarding where Charles was placed made it more difficult for him to find appropriate collaborators and sources of support.

7.6 OTHER INSTITUTIONAL BARRIERS TO PROFESSIONAL SUCCESS

Thus far in this chapter I have described how institutional sensegiving, tenure expectations, the role of chairs, the need for mentorship, and a sense of community are all components of the institutional experience that are related to participants' sensemaking and professional identities. This final section of the fourth research question focuses on factors that may be department-specific or only relevant to the individual participant. Nevertheless, they are worthy of inclusion because the participants perceive them to be hindrances to professional success. Professional success may be an integral component of forming a positive, coherent professional identity. If one is unsuccessful in any core component of professional life, as demonstrated earlier, particular types of professional identity work may be triggered, or the realization that one is unsuccessful in one area of work may act as an interruption to daily life, provoking sensemaking.

The common theme underlying the three remaining barriers to professional success discussed by participants is how the institution is managed. This was manifest in criticism of the financial model by Francis, and description of various administrative difficulties by Isobel, Nicola and Terry.

Francis worked in a clinical department, where he was aware of his financial costs to the department, and his need to bring in revenues – in the form of indirect costs from grants – to cover these costs, since he had no source of clinical funds. He described his financial situation as follows:

So one of the issues I have is that my rent is \$60,000 a year for my 600 square feet. And it's not even clear if they'll offset that against indirects or not, right? I've got to find tuition of nineteen and a half thousand, right? ... And I've been told there's a 95% tax on my student next year. Where's that supposed to come from? And so I'm supposed to raise \$250,000 before I can do an experiment, you know? So I'm being priced out. And I don't think they even appreciate that this is just getting stupid, and I will just leave.

Although I am unaware of the accuracy of Francis' calculations, he clearly felt that financial pressures affected his sense of comfort within the institution. In my experience, some departments, particularly the basic science one, do not show their research faculty individual "profit and loss" sheets. This may be because the dean supports basic science departments financially, whereas clinical departments use their clinical revenues to support their basic researchers. As a result, clinical departments may be more aware of individual costs and revenues than basic departments, which may view them more as a departmental aggregate. Whatever the root cause, the focus on finances is an interruption to Francis' daily life, causing him to integrate this into his sensemaking regarding his current position.

Isobel and Nicola had related, but separate, criticisms of the administrative units within the institution. Both, however, were led, via these criticisms, to question their sense of comfort with an institution that operated in this manner. For faculty with less secure professional identities, it is possible to see how this questioning would spread from being about the institution

to questions about whether the profession is appropriate for the individual. Nicola felt constrained by bureaucracy relating to grant submissions. Isobel had been given incorrect information regarding her tenure and promotion, and her ability to be promoted was subsequently delayed by eighteen months. Isobel, who professed to have a positive outlook, was able to view her experience as having been beneficial for her:

Well when I think about it, I was a little bit uneasy, but then again, when you think back, yeah, a year and a half is long, but there are a lot of other, important things [going on]. So if the other things are going well, I can't complain. So I could have gone ahead, a year and a half ago, not having my second grant. I always look at things the positive way. So it's better to have just delayed this, perhaps for another year. I got another grant – that never hurts.

For someone who had lost funding during these eighteen months, this delay could have caused a different tenure or promotion decision than that which would have been made earlier, leading potentially to a trigger for identity work. In Isobel's case it did not; she was resilient and successful at pursuing funding. However, this could become a potential barrier for other faculty, and therefore something of which the institution should be aware.

The final barrier was described by Terry, who regretted that nobody in his department had been able to provide him with advice regarding his expenditures on grants or his start-up package. He said:

There wasn't a mechanism there to say, "Hey, you can't do that." For instance, if I had money to hire two people, and I hired five, nobody would say anything because I'm the only one responsible. ... We don't have a person who oversees basically all the different budgets and makes sure that all the [money is managed properly]. It's not like that, it's not like I could be totally out of control, like I

could do whatever I want, but I would have hoped for a bit more control, or regulation.

Although this experience did not negatively affect Terry's professional identity or provoke sensemaking, he felt that his professional role would be easier if he had not had to add financial manager to his list of roles. Instead, he thought it would be helpful if this sort of guidance were provided by the department so that he could concentrate on the areas in which he specialized – research, teaching, mentoring, etc. Terry, as noted earlier, was comfortable with multiple roles as part of his identity. For someone without this level of comfort, who had a single, strong identity as a scientist, the need to perform one's own financial analysis may be challenging and disrupt the person's identity equilibrium.

7.7 SUMMARY

This research question has focused on elements that relate to faculty experiences with the institutional culture, personnel, or management. Although much of the sensemaking and identity work that occurs is a function of the individual's identity, it is important to remember that these faculty operate in their institutional environment. They interpret events through an organizationally-delivered lens, living a culture that is strong enough for few to question whether it is appropriate or accurate. Participants' colleagues and department chairs work in the same environment and can help or hinder them in their pursuit of professional success. Although institutional influences on professional identity and sensemaking vary among individuals and institutions, many of the larger themes shared by multiple participants could be relevant for any number of medical schools or faculty in the biomedical sciences.

8.0 CONCLUSION

The results presented in the previous chapters have a number of themes that pervade each research question, and that carry theoretical and practical implications. In this chapter I present the theoretical contribution this research makes to the identity work literature as well as practical suggestions that medical schools with a culture of prioritizing research funding may wish to consider. First, however, I summarize the key findings.

8.1 SUMMARY OF KEY FINDINGS

- Almost all participants had a strong and dominant identity as scientists.
- A loss of funding threatened the existence of participants' laboratories, and therefore became a greater source of identity threat than a negative tenure decision. As a result, faculty viewed tenure as having little practical meaning for the participants.
- Some faculty developed strong resilience to negative funding decisions.
- Along with resilience came a belief in one's ability to influence career success. Participants with a proactive, strategic, and positive career approach contrasted with those who perceived themselves as a victim of the institution or the system.
- The vision held by some participants regarding the nature of science did not match with the reality of their experiences in their current positions. They were surprised by the nature of

faculty work, specifically how much of their time they had to spend doing work other than research, such as writing grants.

- Some participants articulated a perceived lack of academic freedom as they tried to be competitive in securing funding. Others felt their academic freedom and independence was hindered by senior colleagues who were unwilling to let their junior colleagues carve out an independent path.
- A minority of participants were disappointed in the behavior of senior colleagues, which they viewed to be unethical.
- Negative identity work can be used to allow the individual to recognize personal successes beyond the workplace as important, and direct the sense of self through the global identity rather than just the professional identity.
- When the professional position of an individual with a merged personal and professional identity is threatened, so too is the person's global identity. Participants described four ways of dealing with threats to their professional identity threat:
 1. Reconceptualizing the professional self by changing how one views oneself – for example, by keeping one part of a professional identity consistent and changing the focus on one's professional efforts;
 2. Refocusing the professional approach by changing how one performs the work;
 3. Reframing the nature of professional work by reinterpreting what one does as part of professional work, and what one has to do to be successful; and
 4. Renegotiating the meaning of work, changing how much or in what way work is important to one.

- The institution was strongly involved in sensegiving by heavily propagating the notion that success in the organization is defined by funding, particularly from the NIH.
- A number of participants felt unclear about tenure expectations, and even those who expressed clarity in this regard did not describe a uniform set of expectations.
- Department chairs played a vital role in creating or preventing a sense of professional confidence.
- Poor or non-existent mentorship was detrimental to participants' professional success.

8.2 THEORETICAL CONTRIBUTIONS

8.2.1 The groundwork for identity work

The overwhelming majority of participants in this study had a strong professional identity as an academic scientist that was, more often than not, merged with their personal identity. Tony Watson (2008) notes that some careers, such as managers, doctors, and academics, provide sizeable “identity-making resources” (p. 129) for those who are disposed to defining themselves through their occupation. This study suggests that academic biomedical research does indeed fall into this category, providing faculty with a major identity badge that is acquired during graduate and postdoctoral training, and refined to fit within institutional *mores* and personal needs during the early junior faculty years.

In the same article, Watson (2008) notes that identity work is best understood as “a coming together of inward/internal self-reflection and outward/external engagement” (p. 130). The first research question of this study explored how faculty have come to understand, make

sense of, and function within their professional environment. It provided an overview of external forces that can affect the identities of the participants, as well as a glimpse into the personalities of the individuals involved. The faculty participants in this study worked in an environment whose culture embodies a clear understanding of what constitutes success – research excellence, as defined by external (particularly NIH) funding. This culture shapes the profession for those operating within it, particularly at a time when the competition for resources is intense.

The second research question examined the nexus between the external environment and the internal dispositions or internal and socially-acquired expectations of pursuing a career in academic science. Sveningsson and Alvesson (2003) describe identity as a “struggle” (p. 128). The tussle between environmental factors, socialized beliefs and personal desires or characteristics came clearly to the fore as I examined how professional identities were affected by approaching tenure in the current difficult funding environment. Faculty discussed having to make compromises between their hopes and expectations for the institutional or professional culture and the reality of their careers. Pratt, Rockmann, and Kaufmann (2006) describe “work-identity integrity assessments” (p. 241) and the violations that emerged from this process for medical residents. The participants in this study were further in their careers than residents, so they had passed the point of assessing, but were instead in the position of having to make professional identity concessions to accommodate contraventions of their expectations. Making these concessions, whether related to level of independence, academic freedom, ethical behavior, collegial interactions, the nature of the work, or institutional values, carried a different cost for each participant. In general, however, there was some level of cost in terms of work meaningfulness, satisfaction, and motivation. It therefore is possible to see how severe demands for identity concessions may lead an individual to seek a position that requires fewer or smaller concessions.

8.2.2 Additions to and confirmations of the identity work literature

Where concessions cannot be made there is the risk of identities becoming destabilized, necessitating identity work. In addition to work-identity concessions triggering identity work, participants in this study described identity work – both positive and negative – as a reaction to a greedy professional position and the demands of family life. Although the triggers are similar for both positive and negative identity work, the outcomes are distinct. Negative identity work compartmentalizes identities and arranges them in a shifting, vertical hierarchy such that different identities can come to the fore at particular times. Throughout, the self-identity is most often at the summit, guiding interactions. Positive identity work results in a merged identity where distinctions between identities, if made, are viewed horizontally with no particular identity prioritized, and with significant overlap between them.

Faculty engaged in negative identity work employ identity separation tactics similar to those discussed by Kreiner, Hollensbe, and Sheep (2006), but this study deepens our knowledge of these tactics. Priests in the former study appeared to be motivated to use differentiation tactics to preserve individuality while functioning in a greedy role. Beatrice and Karen in the present study resonate with this need, but also articulate a demand for self-authenticity as a motivating factor in seeking to distinguish themselves from their professional position. Put differently, they not only need to see themselves for who they are, but they need to behave in such a way that is true to their senses of (differentiated) selves. Beatrice in particular needs both to preserve her individuality, but also behave in a way that others, notably her family, will recognize as her, rather than the professional scientist version of her.

The positive identity work described in this study also extends our understanding of the integration tactics described by Kreiner, Hollensbe, and Sheep (2006). Whereas these authors

speak of “infusing self-aspects into [professional] tasks” (p. 1044), Isobel infuses professional aspects into her personal life. Thus, what was uni-directional in the earlier study can now be seen as bidirectional.

Prior professional identity formation literature is reinforced by the findings presented here. Faculty described using role models, frequently graduate or postdoctoral mentors, to shape their professional identities, and some had the opportunity to test out a provisional self in a safe environment prior to assuming a fully independent role. These steps to professional identity formation were described over a decade ago (Ibarra, 1999) but continue to be relevant. Other faculty with fully formed professional identities that were subsequently destabilized used splinting (Pratt, Rockmann, and Kaufmann, 2006) as a survival technique. However, instead of using an earlier identity as a splint, as in the prior literature, these faculty used institutionally-supported roles as an identity from which to borrow when they were trying to reshape their own professional identities.

A number of examples described in chapter 2, offered by a handful of researchers, present the concept of identity work as reactive. Following some event that causes, or causes recognition of, a lack of a positive, coherent sense of self, an individual engages in identity work to repair the emergent chasm. The actions associated with identity work by some authors are, by their very nature, *reactive* to and *restorative* from a past event, as evidenced by the prefix “re-,” meaning again. For example, victims of workplace bullying engage in *reconciling* and *repairing* (Lutgen-Sandvik, 2008), and people working in “dirty” occupations *refocus*, *reframe*, and *reconcile* (Ashforth and Kreiner, 1999). In contrast, this study introduces the idea of preventive identity work, which is conducted in anticipation of potential future events so that they do not become problematic. Although there are few examples of preventive identity work presented here, the concept is introduced through the actions of Beatrice, Terry and, Victoria. It is plausible

that by anticipating identity conflicts, concessions, or chasms in advance, individuals may be able to take preventive action and therefore never reach the uncomfortable and intense experience of being forced to undergo identity work.

8.2.2.1 Professional identity work

Various elements of professional identity work have been individually described by researchers who examine identity work in a professional context. This study helps to bring together these different types of professional identity work by providing examples of each that link to other literature. I first draw parallels between existing identity work literature and results from this study, before presenting a proposed novel process of professional identity work (figure 4).

I described earlier how the institution engages in sensebreaking and sensegiving by providing faculty with an idealized role of “academic scientist.” The institution breaks down the faculty members’ notion of success until there is an identity void to be filled. This is achieved by the provision of an institutionally-sanctioned version of a successful professional identity for biomedical researchers. Similar techniques are used by the Amway distribution network (Pratt, 2000) and the British Parachute Regiment (Thornborrow and Brown, 2009), organizations that push their members for constant improvement in seeking greater financial success or closer attainment of the ideal paratrooper, respectively. Similarly to both Amway and the Parachute Regiment, the culture of the institution in this study made faculty feel that no amount of grant funding would ever be sufficient. Although this organizational sensegiving is not a form of professional identity work, it must be considered here as it provides the starting point for the professional identity process: the institutional definition of professional success and the ensuing question, “am I successful in this institution?”

In chapter 6, I presented the case of Peter as someone in the midst of professional identity work. At the time of interview, Peter was debating the question, “do I want to do what it takes to be successful in this institution?” as he faced the distance between his notion of an “ideal prof” and that of the institution. Loi, Hang-yue, and Foley (2004) report that professional identification with a job enhances the meaningfulness of the position to the incumbent, thus improving satisfaction. It is therefore likely that individuals who are uncomfortable with an organizationally-sanctioned role will experience disillusionment and a subsequent fall in meaningfulness, satisfaction, motivation, and performance. Peter’s professional identity work is ongoing, so the outcome and final tactics he may use are unclear. If he decides he is unwilling to do what it takes to be successful, he may have to leave his current position. If he decides he is willing, however, he may accept the institution’s model of an academic scientist until he has tenure, and then set about changing how he and others perform the work by adopting a more holistic approach to his field of interest.

This potential shift in how Peter might perform his work could be a form of job crafting (Wrzesniewski & Dutton, 2001). Job crafting can involve changing: 1) task boundaries, to alter what one actually does at work; 2) cognitive task boundaries, so that one views tasks differently; or 3) relational boundaries, to have more choice over the people with whom one interacts while at work. Peter’s case of *changing his approach to how the work is conducted* is an amalgamation of task and cognitive task boundaries because by changing how he thinks of a problem from the cellular to the clinical level, he changes not only what he might do but also how he views each task. Nicola’s concern of having to change her model of science from a highly collaborative one means that she may also change how she performs her work so that she can continue to be awarded her own R01 grants.

Wrzesniewski and Dutton (2001) focus on crafting particular elements of a job, whether practical, cognitive, or social. Rebecca has taken job crafting a step further, altering not what she is doing *in* her job but what work *means* to her. Whereas previously her global identity was threatened by failing to secure funding, she has engaged in professional identity work to reduce the importance of her work for her overall happiness. By viewing tenure as a game, she has reduced her previously self-imposed pressure to succeed. As a result she has become more confident and more willing to take what she might have earlier viewed as risks. Thus, she has removed the power of the institutional definition of success to affect her professional identity. While she operates within the institutional culture, she is able to make her own assessment as to whether she is successful and how much that matters. In summary, she has *changed her relationship with work*.

The professional identity work conducted by Daniel is related to that of Rebecca, but the relationship between work and his professional identity is not open for negotiation. Daniel changes the meaning of what is successful work by stating that the science being conducted at the institution is not “true” science. Instead, real science for him is applied, as conducted in industry. With this alternative interpretation of science, Daniel is rejecting the organizational norms and, with them, its cultural understanding of success. His *challenge to the organizational view of success* allows him to maintain his professional identity as a scientist despite the fact that he may have to change organizations to continue conducting what he sees as true science. A similar type of identity work is described by Riach and Loretto (2009) in a study of the older unemployed, whose participants created an open interpretation of what constitutes work so that, for example, any position can be seen as work, irrespective of whether it is paid or a volunteer position. In figure 4, the professional identity work of challenging organizationally-sanctioned views of success can be equated to the perspective of these older unemployed workers.

In this study, Sally also had an unconventional interpretation of herself with regards to her work. Rather than seeing herself as a scientist, she saw herself as an investigator who happened to be working on biomedical problems. This makes it easier to *change the focus of her professional efforts* to investigate other mysteries without experiencing any significant change in professional identity. This type of professional identity work is similar to the “reframing” conducted by people working in “dirty” jobs (Ashforth & Kreiner, 1999). Reframing is described as “transforming the meaning attached to a stigmatized occupation” (p. 421), and often involves “infusing” (p. 421) a stigmatized task with some positive value. In Sally’s case, the equivalent to the stigmatized task is science, although for her it is less stigmatized than treated with some ambivalence. The positive value is carried by her longstanding desire to be an investigator of crime scenes. She thus is also “refocusing,” described in the same study (p. 423), which involves ignoring one part of a job or task and prioritizing other elements. Sally prioritizes the investigation actions over the object of her investigative activities.

Figure 4 is a process model of the professional identity work described above, drawn from this study and other literature. Starting at the top of the figure, the organizational and professional cultures combine to create the institutional definition of professional success (purple). Based on this definition, individuals assess their degree of success and question whether they want to participate in the behavior that is necessary to be considered successful. The answer to this question is determined by a number of factors, the most important of which is likely to be whether they feel the behavior fits with their personal identity, which is shown as encompassing the question “do I want to do what it takes to be successful?”

The questions that professionals ask themselves as they hypothetically move through this process of professional identity work are depicted in yellow. Each question has a bivariate (yes or no) path, except for the question about tensions, which is followed by three possibilities for

not wanting to be successful. The four types of professional identity work described in the results chapter are shown as green hexagons. All but one, “change how work is performed (job crafting) can be reached by only one path.

The path is iterative in that faculty who do not fit the institutional definition of success may require more time to be successful before they feel they are ready, or compelled, to engage in professional identity work. Other faculty may wish to do what it takes to be successful but feel incapacitated by the institutional culture or management. This latter group may also require more time until they either become successful in the eyes of the institution or job insecurity forces them to re-evaluate their professional identity. Faculty needing more time remain for as long as necessary in the blue ‘stopping out’ periods, before they follow the iterative arrows (red) and re-enter the model with the question of whether they are successful.

Three of the types of professional identity work also lead to the red, iterative arrows because, once conducted, these types of identity work should lead the identity worker to a different path through the process. The one type of identity work that does not link to the iterative path, “challenge organizationally sanctioned view of success,” is an end point because the organizational culture or definition of success at which the process commences no longer applies in this case. Those who adopt a definition of success that is contrary to the institution’s culture may experience a fall in institutional commitment and thus eventually decide to seek a culture where their definition of success is more widely accepted. Following this route, therefore, has negative implications in terms of organizational retention, but enacts a “survival of the fittest” approach to human resource management. This management style may be desirable for leaders seeking institutional advancement along predetermined measures of success, but may result in a culture that is perceived as intensely competitive, unwelcoming, and uncaring.

Progression continues until the individual no longer requires professionally-motivated identity work or contemplates (or even enacts) institutional departure. Both of these end points are light grey. The remaining end point (orange) is the need to conduct some other form of identity work not represented in this figure.

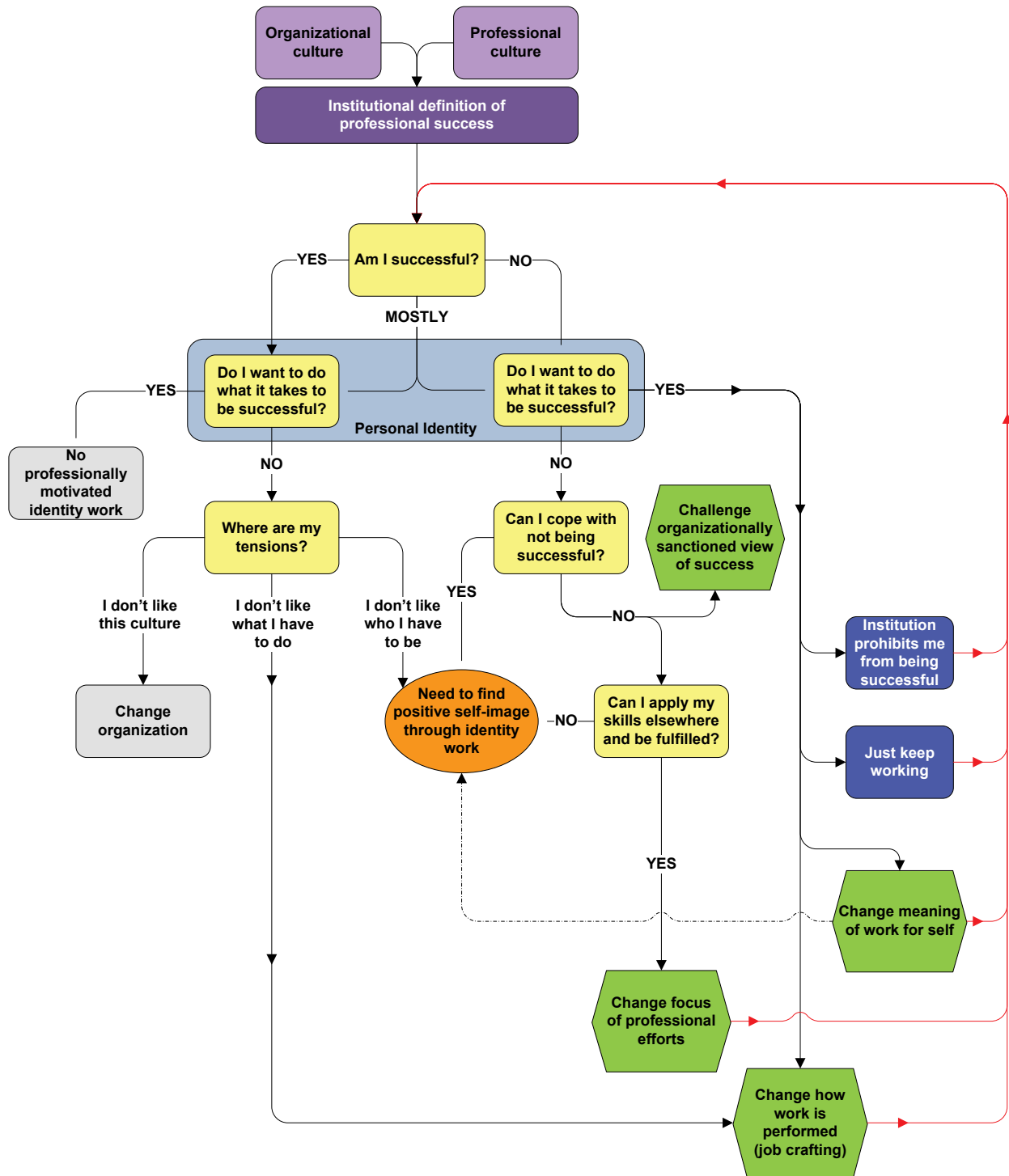


Figure 4: The process of professional identity work

8.3 PRACTICAL SUGGESTIONS

In addition to the theoretical contributions of refining our understanding of identity work motivations, triggers and types, and a new collective view of professional identity work, this study's results provide a number of practical implications for medical school administrators and faculty. A summary of recommendations for various constituents of medical schools (table 9) is presented on page 195.

8.3.1 Breaking out of the “no” cycle

Since faculty appears to attribute little practical meaning to tenure, unless they also have grant funding, more attention should be paid to helping faculty secure and keep funding so that they can focus on writing publications and teaching rather than continually writing grants. Success in this regard would then allow faculty to appreciate the tenure as it is intended by the AAUP (American Association of University Professors, 1940).

Perhaps the most important step with regards to funding is to help faculty remain outside of the “no” cycle (figure 3). Starting at the top of the cycle, faculty have no funding. This makes it difficult to procure supplies, or pay staff to conduct experiments. One source of support, therefore, could be institutional funds that are competitively awarded by the dean to faculty in need of supply money. This could be as little as \$15,000 over four to six months, allowing faculty to conduct a pilot study to provide preliminary data for a grant application. With regards

to paying personnel salaries, there may be support on institutional training grants for postdoctoral fellows or graduate students. Highly meritorious faculty could also be awarded a stipend with which to pay a technician or non-trainee staff. Working together with a senior colleague for mentorship, the faculty member would thus try to make judicious use of limited resources to get data from which to write a manuscript and/or grant application. It may also be helpful to pair struggling faculty with colleagues in a similar field so that they develop collaborations that could result in publications for both, but using fewer resources. The collaborating colleague might receive a “collaboration incentive” of more resources or release from some duties.

It would be important to make the awarding of these small amounts of funding competitive, and for the awardees to have compulsory mentorship and career counseling from willing mentors. The competition would prevent those who are unlikely to be successful in the future from using up limited resources. Mentorship should help guide younger faculty, and provide a sounding board for senior faculty who need additional guidance. Finally, career counseling should help faculty consider the possible alternatives if they are not successful in securing funding or producing publications after this small allotment of institutional funds. For untenured tenure track faculty caught in the “no” cycle, the career counselor could suggest seeking non-tenure track employment opportunities within the institution or other external positions. Unfunded tenured faculty could be matched with other PIs who have funding and require skilled senior researchers to work in their laboratories. They could also be guided to explore institutional administrative positions or pedagogically-focused paths that would use their skills outside the laboratory. Any career guidance would have to be conducted sensitively and in a manner that best protects the faculty member’s potentially fragile professional identity.

8.3.2 Postdoctoral training

The data from research question one also showed that some faculty can drive their own successes and build their own barriers. This idea fits well with Weick's (1995) proposition that sensemaking is enactive of sensible environments. If this is the case, it is important that faculty are helped to develop proactive and resilient stances towards their research and careers. Several faculty mentioned the need to plan for one's career five years in advance and take a strategic approach to attaining objectives. This skill, like resilience, is best acquired during graduate and postdoctoral training. It may therefore be helpful for postdoctoral offices in medical schools to design programs based on creating the resilience mind set and teaching strategic career planning. Although a number of faculty participants in this study learned these skills and ways of thinking from their mentors, this is not the case for everyone so an institutional program would be beneficial.

Another element that should be included in postdoctoral training is a program akin to the 'Preparing Future Faculty' program, which addresses "the full scope of faculty roles and responsibilities that include teaching, research, and service, emphasizing how the expectations for these responsibilities often differ in different campus settings" (Council of Graduate Schools, 2010, para. 5). This program would help postdoctoral fellows in biomedical research become better informed about the realities of faculty life in a research-focused medical school, and compare it to other possible career paths. This might prevent some postdoctoral trainees from pursuing a faculty career simply because it is expected of them and they are not fully informed of alternatives. It would also mean that when they become junior faculty, graduates of such a program may experience fewer chasms between their expectations for a position and the reality. Ultimately, this should result in higher job satisfaction, productivity, and success.

Two participants in this study had not had postdoctoral positions. They considered this to be harmful to their careers in that they had less experience and socialization into faculty life prior to assuming their faculty role. They also had fewer mentors than colleagues who had done two or three postdoctoral fellowships, and who therefore benefitted from being able to consult with a number of present and former mentors. Therefore, my final recommendation for postdoctoral training is that chairs should be wary of hiring graduate students in the biomedical sciences directly into a faculty position, no matter how talented they may appear. Ultimately, it appears that to do so may be a disservice to the individuals involved.

8.3.3 Actions for chairs and senior faculty

Once junior faculty have been in their positions for several years and are ensconced in the reality of seeking funding and writing publications as they move towards their tenure bid, it appears beneficial for medical schools to have in place a system of helping those who experience a reduction in motivation that is either caused by, or leads to, reduced success. Most important for those experiencing a decline in motivation would be career counseling to understand the source of discontent or reason for a loss in motivation.

With a dialogue thus opened, some institutional system to help faculty foster multiple collaborations in addition to their own, independent, research may be beneficial to some faculty members. Although independence in research and publications where the individual is the senior author are important factors for tenure at many medical schools, being involved in several ongoing collaborations could help maintain faculty focus and success in a number of ways. First, working with colleagues provides some level of accountability to faculty who may be inclined to reduce their efforts due to declining motivation. Second, collaborating with successful, engaged

colleagues can provoke the individual's intrinsic motivation that may have been only temporarily lacking. Third, good collaborations can help faculty be successful in one project even while they are struggling with others, allowing the individual to sustain partial funding. Fourth, having several ongoing research projects allows faculty to have more than one line of inquiry in case one in particular fails. Naturally, there are potentially negative sides to this idea, as relationships may not develop as expected, and pursuing too many projects in an unfocused manner can prevent a junior researcher from reaching significant success in any project. However, thoughtful guidance from chairs and senior faculty who are aware of many colleagues' research skills and interests could be beneficial in this regard.

Chairs and senior faculty can offer support to junior faculty in a number of other ways. Some participants in this study discussed their desire to have functional mentoring committees. Department chairs are rarely trained as managers and leaders, and research indicates that chairs have a variety of training needs (e.g., Shahnaz et al., 2005). Specific to this study, it would be helpful for junior faculty if chairs attended a course on good mentorship and enacted published recommendations (e.g., Zellers, Howard, & Barcic, 2008). It is impractical to expect chairs to mentor all junior faculty by themselves. Instead, they could appoint a number of successful, personable, senior colleagues to share the mentoring duties so that all junior faculty have ready and easy access to a senior member of the department. Mentors should, where possible, receive additional resources or compensation for this role. It would be very important for the chair and senior mentoring colleagues to have mutually understood goals and priorities for their junior faculty mentees so that appropriate advice is given by faculty who are not the chair. Committees could equally fill this role, assuming the availability of senior faculty. Participants indicated that some departments have done this but the mentoring is not effective due to mentors' lack of time or prioritization of this activity. Changing cultures of institutions is time- and effort-intensive on

the part of leadership, but it may be necessary to underscore the high priority and value placed upon mentoring activities so that senior faculty participate meaningfully.

Separate from mentoring duties, chairs should be sure to meet with their junior faculty at least annually. Even though this is currently an institutional policy, it emerged in discussions with participants that this does not always happen. During this annual meeting, chairs should have a frank discussion with junior faculty regarding their progress towards tenure. Chairs may like to evaluate their faculty each year using any institutional forms that are used for tenure decisions, as was done by the chair of one of this study's participants. Doing so provides faculty with a clear understanding of the parameters on which they will be judged, and allows them to assess themselves regularly against them. Regular and open discussion about tenure evaluations should not only clarify expectations for junior faculty, but also encourage those who are struggling to begin early discussions about alternatives. This approach may allow faculty to engage in early preventive professional identity work that is not as emotionally wearing as professionally-motivated identity work may be if it occurs in response to professional difficulties.

8.3.4 Institutional seminars

Participants suggested a number of types of seminars that may be helpful. They admitted that with the time pressures of faculty life and the focus on funding, it is often difficult to attend. Nevertheless, they felt the following would be helpful and appreciated by faculty.

First was the suggestion of seminars about tenure, distinct from chairs' guidance, that could help to clarify tenure expectations and explain the purpose and process of being awarded tenure. They could also include fictional but realistic tenure case studies to help faculty

understand the multiple factors that together form the basis of a positive or negative decision. These tenure-related suggestions might appear unnecessary given the finding that tenure was significantly secondary in importance to funding. However, programs elucidating tenure expectations were repeatedly suggested by participants as actions that the administration could take to help junior faculty.

Another potentially beneficial seminar for some junior faculty is one in which alternative careers are presented and explored. Several participants spoke about the possibility of moving to industry if their academic career stalls, but they recognized that they were not fully cognizant of what changing sectors would entail. Having the opportunity for faculty to investigate alternatives may help those who are preparing themselves for all eventualities along their tenure track. The problem with a public forum like a seminar, however, is that faculty may not wish to be seen participating, and therefore turnout might be low. An alternative to the seminar format is a publicized contact list of people to whom interested faculty could speak confidentially about alternative careers. Maintaining confidentiality and the trust of the relevant faculty would be paramount to the success of such an arrangement.

8.3.5 Suggestions for departments

Several participants in this study expressed dissatisfaction with their lack of meaningful orientation at the time of hire and their ability to secure administrative help. Although one or two had attended a brief orientation, they said it was not helpful because it was very quick and was never followed up. This left the faculty member bewildered by the magnitude of new information and unable to navigate their new environment effectively. It may be impractical to have a longer medical school orientation (distinct from the university-wide faculty orientation).

However, departmental administrators could play an active role in following up with faculty at regular intervals during their first year to determine that they are fully informed about relevant resources and procedures.

Department or division/center/institute administrators should also pay attention to the need for, and distribution of, administrative help. One participant spoke of having no administrative help to compile NIH grant applications, meaning that instead of having extra time to focus on the scientific component of her grant, the faculty member was having to learn grants administration. This contrasts starkly with a participant in another department who praised the departmental grant administrator's efficiency. The faculty member was able to focus fully on science, reassured that the staff member would compile the other aspects of the grant. Even when resources are scarce, it would be beneficial for faculty to have this administrative help if it increases the likelihood of securing funding, because the additional facilities and administrative costs from one extra grant may cover the additional expense of the required administrative staff member.

The final suggestion for departments is to instigate a meaningful internal grant review process. This is another suggestion that some departments have tried to implement, but that has failed to take root or provide feedback the manner intended. Grant reviewers would have to be faculty experienced in serving on study sections for the appropriate funding agency and be well funded, so they were not under pressure to focus on their own grants instead of helping their colleagues. Faculty participants in this study suggested that individual reviews from multiple reviewers are less helpful as they provide three contrasting suggestions for improvement. Instead, a team approach to grant reviews would be more effective at presenting junior faculty with multiple, but integrated, suggestions for increasing the likelihood of securing funding.

8.3.6 Institutional policies

There are four suggestions for beneficial refinements to institutional policies that emerged from these interviews. The first is the proportion of salary that faculty should be expected to cover with grant support. Some faculty, like Adam, stated they were expected always to cover 100% of their salary. Others indicated that less was sufficient to satisfy their chair. A uniform approach across departments would improve institutional transparency and would be easily communicated to new faculty members. Faculty with service or teaching activities should not be expected to cover 100% of their salaries on grants, as to do so would indicate that they should expend all their effort on research. Since tenure track faculty are expected to participate in service activities and teaching, careful consideration may be warranted as to a more suitable level of salary coverage. The problem with reducing salary expectations, however, is the provenance of the funds that support the remainder of faculty salaries. It is unlikely that medical and graduate school tuition would suffice, given that in the biomedical sciences most graduate students receive tuition and a stipend from their mentor's grants. Similarly, clinical revenues may be unpredictable or required to support clinical endeavors. The final major source of support for some institutions – the state – appears unrealistic given the current economic difficulties and fiscal deficits in a number of states. This suggestion requires consideration and a uniform policy across departments, but I acknowledge the practical difficulties in reducing salary coverage expectations.

The aforementioned tendency for doctoral students to be funded through grants was another criticism by participants, who felt that institutions should provide some support for students. The same financial impracticalities arise with this suggestion as with the former. However, if there were more centralized fiscal support for students, there would be reduced risk

that students' training would be interrupted if faculty lost funding. It would also allow lower-funded faculty to contribute to the educative mission of the institution without having to find the funds to support students. They, in turn, would benefit from having an extra scientist in their laboratory to conduct experiments. Training grants that are held by departments are of some benefit in this regard. However, they are often only open to US citizens, and are limited in the length of time for which they can support a graduate student. Therefore more centralized support would be helpful.

The third suggestion is that tenure committees should become familiar with Boyer's (1990) reconsideration of scholarship, and be open to appreciating contributions to the scholarly community other than research. Rebecca summarized this need succinctly:

They should also be very cognizant of what it takes to do teaching combined with research. So they should give more weight to teaching, and I think they're starting to do that. They shouldn't expect that everyone will have the same portfolio.

Everybody can't be judged in the same way.

Of course, tenure committees seek evidence of a continued ability to secure external funding, but perhaps there could be less of a focus on NIH funding and willingness to accept other sources of funding for faculty who also make a significant contribution to the institution in other ways.

The final suggestion for institutions is to pay attention to the most appropriate departmental affiliation of faculty with PhD degrees. A full examination of the departmental culture of clinical and basic departments was outside the scope of this research. However, there were several instances when faculty in clinical departments attributed their complaints surrounding institutional matters or lack of mentorship to their position in a clinical department. Basic researchers in clinical departments may find themselves feeling alienated and undervalued because they do not conduct clinical work and they cannot bring in the same level of revenue as

medical doctors working in the clinic. Almost all faculty in basic science departments reported having a good relationship with their chairs, which was not the case for faculty in clinical departments. This may be a function of the size of departments, but the result is the same – less mentorship and guidance, and a reduced sense of departmental fit.

8.3.7 Practical realities of suggestions

The above suggestions all stem from complaints or suggestions made by faculty participants. Some are more practical than others, and some are more resource-intensive, whether in money or time. Not every suggestion will be possible for every institution, and significant latitude would be necessary in implementing any of these proposals. Despite such potential difficulties, these suggestions may be helpful for medical school leadership to consider, as they provide the spirit, if not the exact format, of what junior faculty would appreciate or need as they prepare for tenure. Implementation of these proposals may help faculty facing the potential of professional identity disruption or destabilization.

Table 9: Summary recommendations

Audience	Action Points
Medical school deans and other senior leadership	<p>Provide small amounts of funding to help break out of the “no” cycle</p> <p>Review faculty salary coverage expectations to ensure similarity across departments</p> <p>Establish institutional funding for doctoral students</p> <p>Appreciate multiple types of scholarship</p> <p>Consider which departmental affiliation will be most supportive for junior faculty with PhDs</p> <p>Train chairs regularly on best practices for faculty development and mentorship</p> <p>Reward senior faculty for mentoring junior colleagues</p>
Faculty affairs professionals	<p>Establish institutional seminars about the tenure process and practicalities</p> <p>Make available to faculty contacts in other sectors who can confidentially discuss alternative careers</p> <p>Offer the services of a career counselor</p>
Department chairs	<p>Establish a meaningful grant review processes that provides one combined review from multiple senior colleagues, prior to submission</p> <p>Facilitate collaborations for those who may benefit from additional (perhaps more successful) paths of inquiry</p> <p>Provide/arrange mentorship</p> <p>Discuss tenure annually</p>
Department administrators	<p>Provide relevant faculty orientations, following up with new and junior faculty about any difficulties at regular periods</p> <p>Introduce faculty to peers they may not otherwise meet, to help establish a sense of community</p> <p>Pay attention to the need for, and distribution of, administrative help</p>
Postdoctoral mentors and offices	<p>Build resilience skills by modeling behavior and giving postdoctoral trainees the chance to experience rejection in a safe environment</p> <p>Teach strategic career planning</p> <p>Manage expectations about academic careers by providing in-depth information about the reality of faculty life</p>
Graduate student mentors	<p>Strongly encourage students who are interested in an academic career to pursue postdoctoral training</p>

8.4 FUTURE RESEARCH

The identity work literature is relatively young but expanding. The main theoretical contribution of this study – the process of professional identity work, figure 4 – needs to be tested by other researchers to determine its applicability and relevance in other environments and careers. It may be tested most usefully in other academic departments, like engineering and natural sciences, where grants supplement nine month salaries but are not the staple of an academic livelihood, and careers that have tenure-like systems such as law and accountancy firms, where junior employees work towards partnership. Other competitive situations such as members of the military seeking to be recruited into elite forces may prove fruitful venues in which to explore the validity of my proposed process of professional identity work.

A similar study should be conducted outside of a medical school at the same university. Given the large differences in financial models of medical schools compared to most other schools within a university – particularly those with undergraduates – it would be worthwhile to see if the different financial environment and system would provoke differences in findings from each of the four research questions.

Another potentially fruitful line of research could be to study a small number of faculty in the two years prior to, and during, the tenure process, from the compilation of a portfolio through to a final decision, to see if there are any different acute identity issues that arise. Related to this could be a study of people who have been denied tenure but who have been able to remain in their institution off the tenure track, funded by grants. This would enable retrospective, rather than prospective or current, views of any identity destabilization, and would better capture the retrospective quality of sensemaking. As a follow up from such a study, data could be mined to develop a set of attributes or qualities that are more common among faculty who are successful,

however the institution in which the study is conducted defines it. The third step in this path of inquiry would be a quantitative study to test the prevalence of said attributes among faculty considered to be flourishing. This would lead to institutional guidance of how to train and/or select future faculty to be successful in that particular environment.

A final area of research suggested by this study relates to organizational culture. A quantitative study could investigate the relationship between faculty commitments to their institution, and vice-versa. A qualitative study could then follow up the quantitative work by questioning how institutional and faculty commitments to each other affects institutional vitality.

APPENDIX A: INTERVIEW QUESTIONS

On Being a Scientist (adapted from Kreiner, G. E., Hollensbe, E. C., and Sheep, M. L. (2006)

1. What led you to become a scientist?
2. What are the characteristic qualities you would consider to be a typical for a scientist?
3. How much does your vocation define you as a person? That is, is being a scientist something you DO or is it something you ARE? Please answer first generally and then for you personally.
4. Have your attitudes about this changed over time?
 - a. Probe: From what to what?
 - b. Probe: What kinds of things prompted that change?
5. How did you learn to be a scientist?
 - a. Probe: What role did others play in this process?
 - b. Probe: How did you learn role-relevant behavior, such as dealing with manuscript or grant rejections?
 - c. Can you give me an example of how you reacted to your most recent manuscript or grant decision?
6. Has the change in the NIH economy over the past five years made you feel differently about what it means to be a scientist, or about yourself as a scientist?

On Funding

7. Tell me about your funding history – when did you get your grants, was it difficult, have you renewed any?
8. Do you feel confident about getting more grants?
9. How do you think funding is related to tenure for biomedical researchers with PhDs?
10. Have you ever worried about your own chances for tenure?
 - a. Probe: What made you worry?
 - b. Probe: What were the thoughts that went through you head most frequently related to that?
 - c. Probe: Did anything make you feel better?
 - d. Probe: How did/do you cope with the pressure or anxiety?
11. (If relevant) Have you ever thought about what you would do if you didn't get tenure?
 - a. Probe: If you did x (if the individual has something in mind), would it affect how you thought about yourself as a scientist?

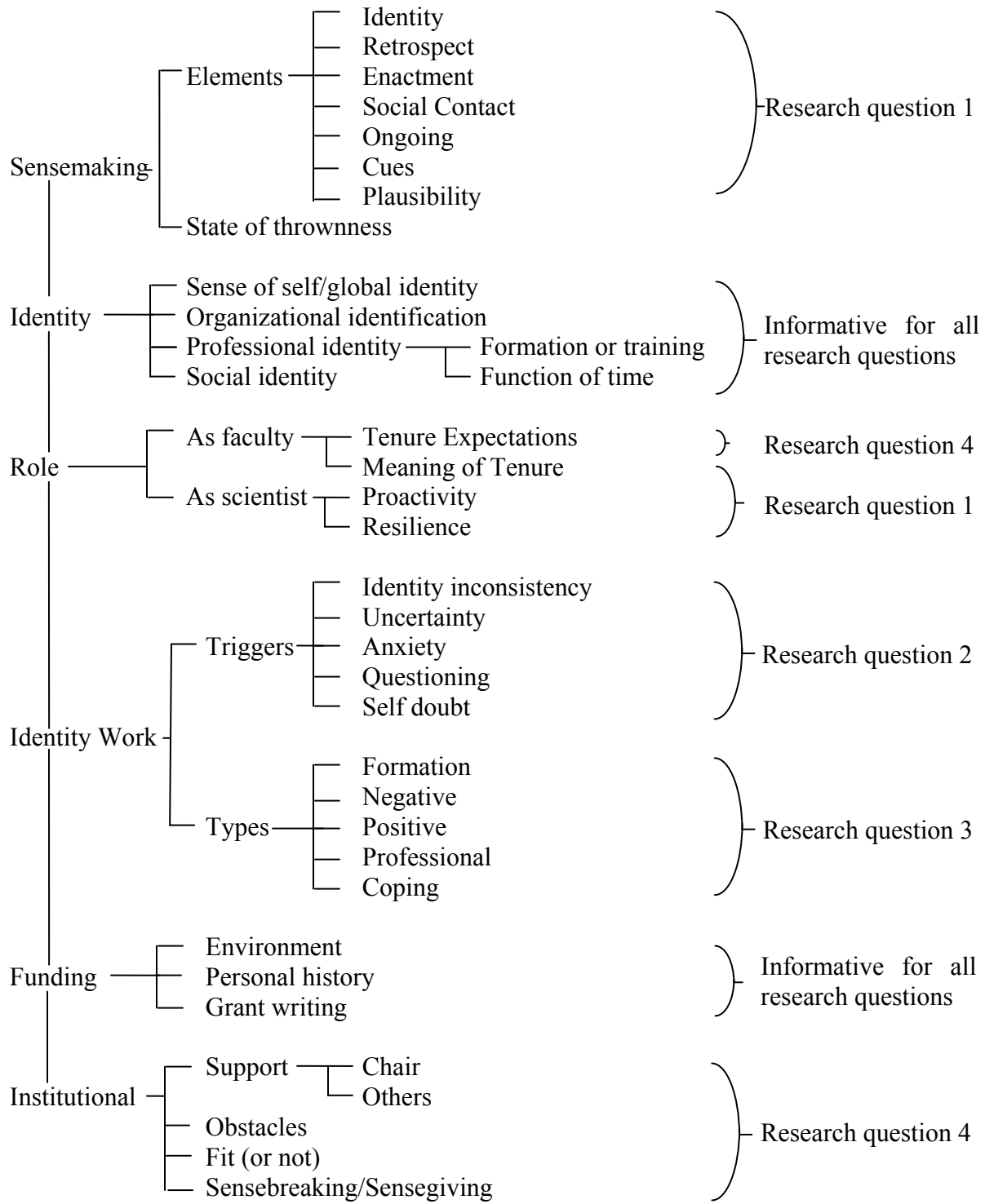
On Institutional Role

12. What pressures did you feel most from the institution with regards to coming up for tenure?
13. Did anyone or anything provide you with specific help?
14. Was anything specifically unhelpful?
15. What do you think the institution could do to help people in your situation?

Concluding

16. Is there anything else you would like to talk about that you think would help me understand the experience of assistant professors who are coming up to tenure with reduced levels of funding, what it means, and coping mechanisms?
17. Do you know of other individuals to whom I ought to speak?

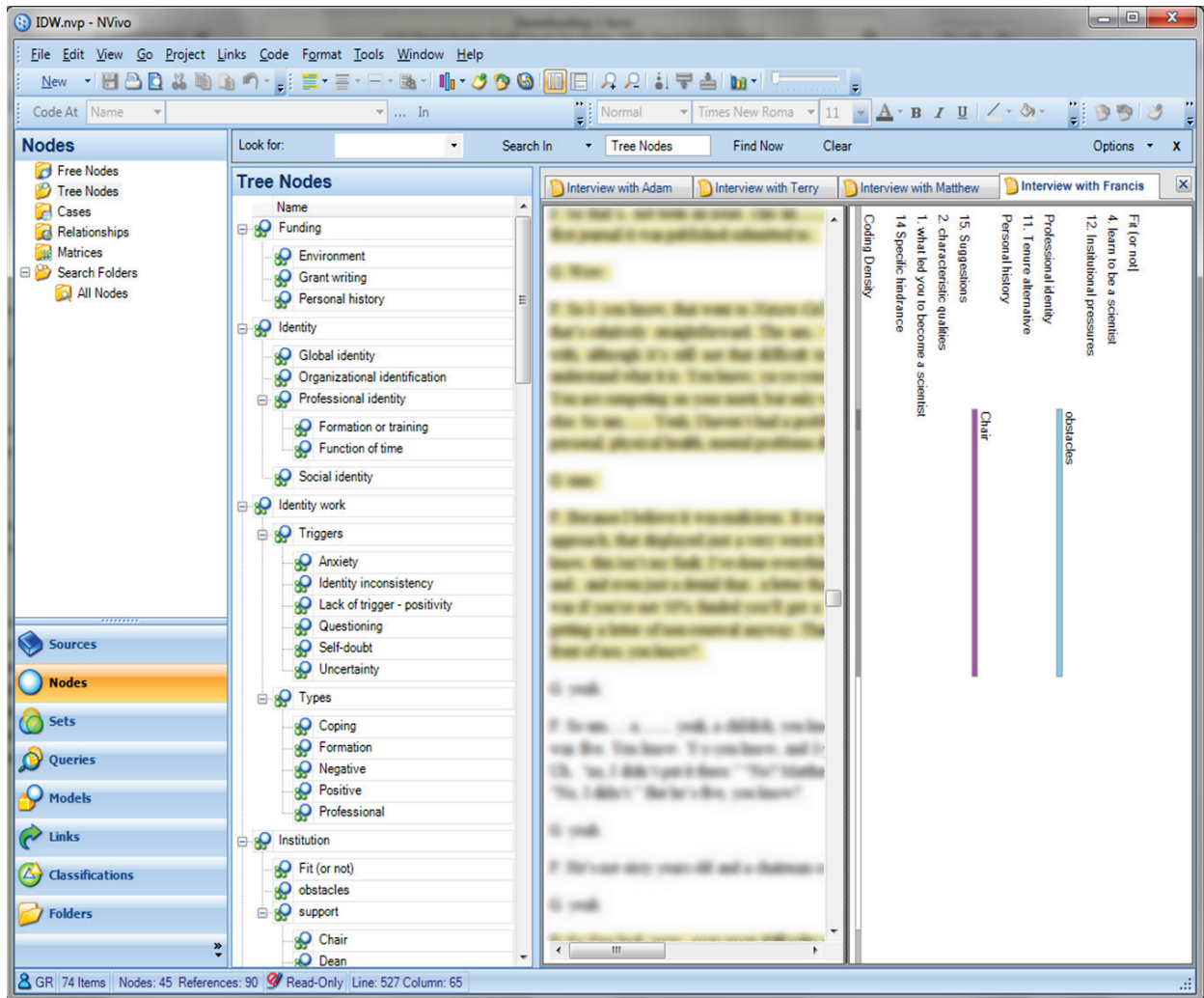
APPENDIX B: NODE TREE AND FREE NODES



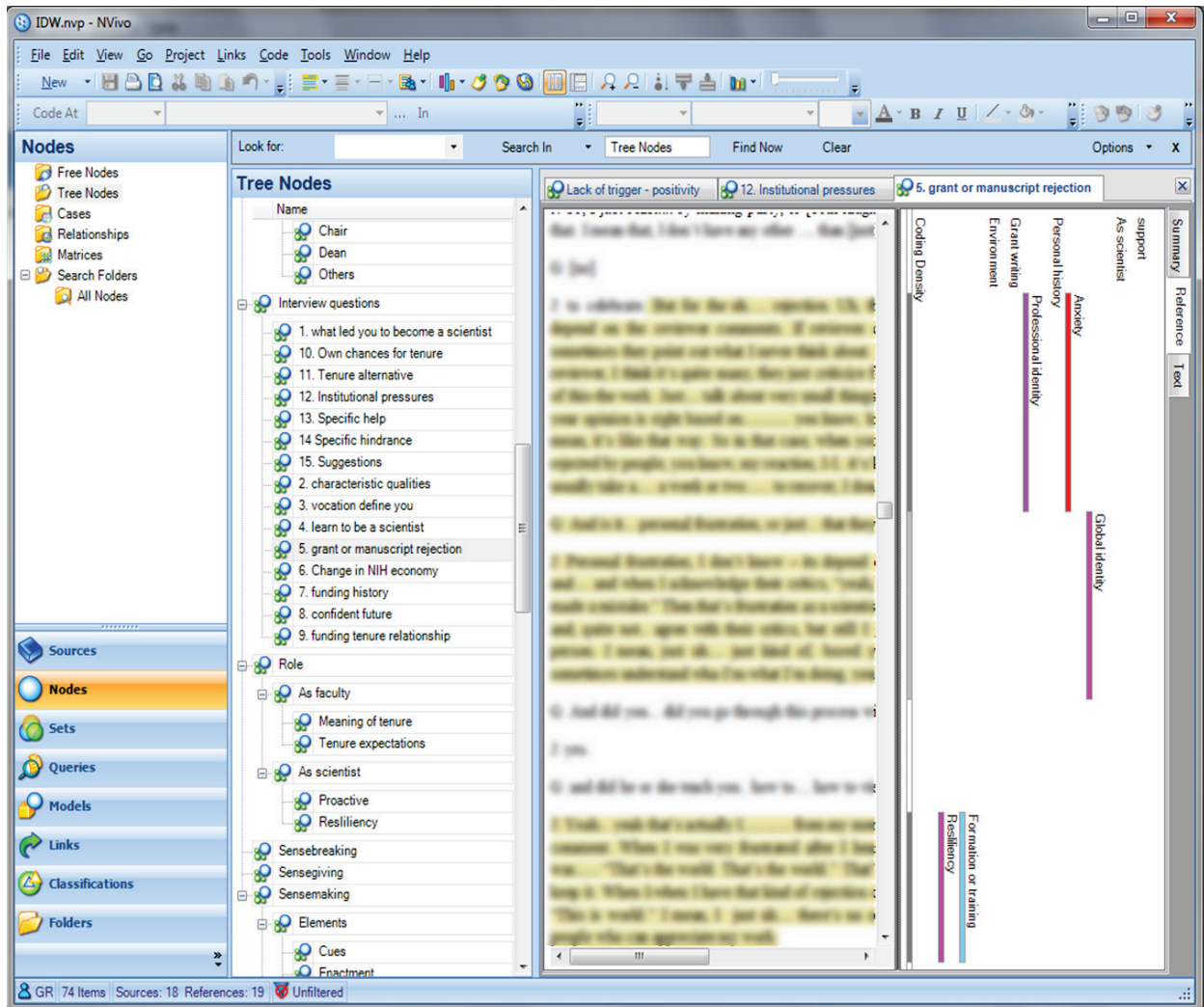
Free Nodes:

- What do I do with this?
- Absolute gems
- For future research
- Interview question 1
- Interview question 2
- Interview question 3
- Interview question 4
- Interview question 5
- Interview question 6
- Interview question 7
- Interview question 8
- Interview question 9
- Interview question 10
- Interview question 11
- Interview question 12
- Interview question 13
- Interview question 14
- Interview question 15
- Interview question 16

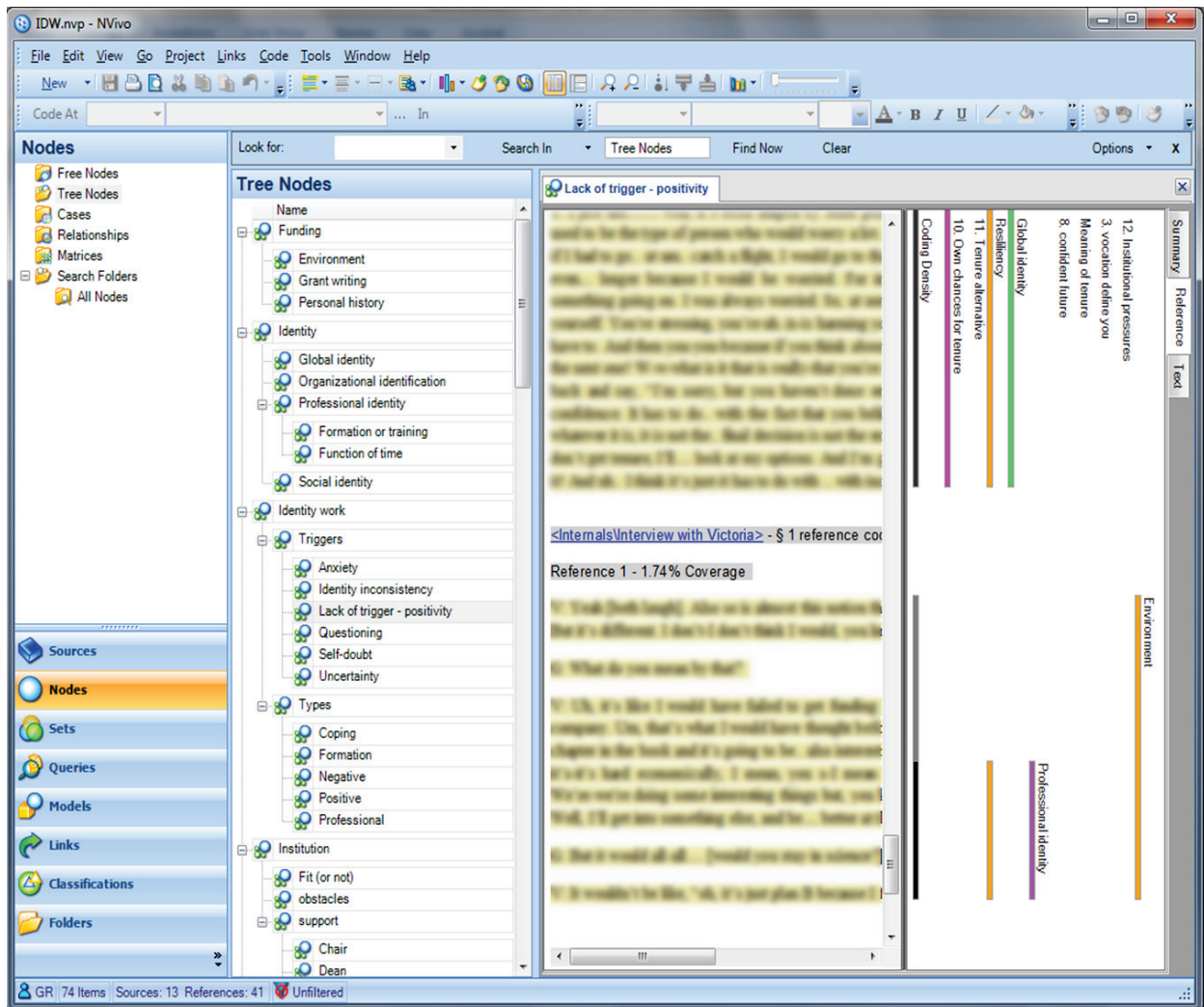
APPENDIX C: SCREEN SHOTS OF USING NVIVO8



Screen shot of coding individual transcripts within NVivo8, with coding stripes showing how data can be simultaneously coded at multiple nodes.



Screen shot of analyzing interview questions within NVivo8, with coding stripes showing how data can be simultaneously coded at multiple nodes.



Screen shot of analyzing single nodes within NVivo8, with coding stripes showing how data can be simultaneously coded at multiple nodes.

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