"Untying Our Hands": A Mixed Methods Study of Strengths-Based Approaches to Faculty Recruitment and Hiring Practices in STEM for Equity

by

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Dedication

This dissertation is dedicated to those that came before me and paved the path for me to have the privilege to pursue a doctorate, *Mom, Dad*, *Abuelita Lola, Abuelita Carmen, Abuelito Manuel, Queñita, y Tata;*

To my partner in life and on this journey, without whom I wouldn't be half the scholar, wife, nor mother I am today, *Mark;*

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Abstract

As has been well documented in higher education, while the national demographics have continued to rapidly shift, the comparable student demographics have been slow to shift and faculty demographics have not kept pace. The attention on the inequities in the professoriate have been highlighted in the media, most prominently as a result of student protests and advocacy efforts pointing to the low numbers of faculty of color, specifically, and women faculty in certain fields including STEM. With hiring practices as one of the major gatekeeping routines between the PhD and the professoriate, scholars have pointed to strategies within recruitment and hiring that can innovatively be explored within the parameters of legal constraints experienced in some states, through Affirmative Action restrictions. Accordingly, this study explores effective approaches that STEM departments tending toward positive deviance are implementing to attract more women faculty and/or faculty of color. Using a convergent parallel mixed methods research design, this study leverages the results from a Zero Inflated Negative Binomial (ZINB) and Binary Logistic Regression Analyses of 10 years of job posting data (2006-2016) and insights from a comparative case study analysis of 5 STEM case studies at Midwestern University. The results indicate that effective recruitment and hiring of women faculty and/or faculty of color in STEM is facilitated through approaches in all four quadrants represented in the Competing Values Framework (CVF) – collaboration, competition, routines, and non-routines. The quantitative and qualitative findings together point to 3 broad thematic approaches of: necessary leadership, the search process itself, and focusing on organizational climate. Each of the thematic approaches highlighting individual efforts represented in the varying quadrants of the CVF. This study concludes with a set of praxis-based recommendations for campus and departmental leaders that are working to attract a more compositionally diverse faculty, and for scholars looking to further develop this line of inquiry.

Chapter I: Introduction

Significance of the Problem

Diversity and equity have long been contested topics on college and university campuses. Today, it is not the value of diversity that is necessarily questioned, since structural diversity is widely understood as important to higher education learning (Chang, 1999; Gurin, Dey, Hurtado, & Gurin, 2002; Hurtado, 2001, 2005, 2007). With structural diversity understood in the higher education literature as the "numerical representation of diverse groups" (Bowman, 2012; Clarke & Antonio, 2012; Cole, 2007; Gurin et al., 2002, p. 333; Hurtado, Milem, Clayton-Pedersen, & Allen, 1998; Jayakumar, 2008), the value of students from diverse backgrounds and experiences has also come to be seen as an *educational* benefit for all (Hurtado, 2007; Gurin et al., 2002). Tension regarding campuses' need for preparation of diverse populations no longer exists, as "diversity" has begun to arrive on many campuses (Smith, 2009) albeit at an extremely slow pace in comparison to the nation's changing demographics. Rather, the source of contention is, and has been, in the approaches that campuses have imposed—or failed to impose— on their student structural diversity (Gaertner & Hart, 2013; Hurtado, Milem, Clayton-Pedersen, & Allen, 1998; Tierney, 2007).

Most of the diversity discourse has historical roots in the tensions that emerged from imposed policies, such as affirmative action, to address centuries of social and educational inequity. Over the last four decades, the pace to address these tensions in higher education has been slow and the educational benefit of diversity continues to be debated. Moreover, this tension has recently been refueled by national headlines spotlighting student demands for

increased structural diversity at the student *and* faculty level. Campuses and their respective departments are forced to reflect on the adequacy of their efforts to date and to reconsider approaches to increase levels of both student *and* faculty diversity.

While the argument for the *educational benefits of student diversity* (Hurtado, 2007; Gurin et al., 2002) has come to be generally accepted, a rationale for the *benefits of a diverse faculty* is less recognized. Similar to the foundational argument for the education benefits of diversity, individuals from diverse backgrounds contribute a variety of perspectives to the educational environment (Hurtado, 2007; Gurin et al., 2002). Given the rationale of Gurin et al. and Hurtado, the equivalent may be extended to include faculty – as instructors, role models, mentors, researchers, innovators, and campus members, all of whose roles contribute to diverse backgrounds and perspectives in the educational environment. Gurin et al. (2002) urge campuses to recognize the role that diversity plays in preparing students for an increasingly diverse workforce. Faculty with diverse backgrounds and experiences who are leading the instruction and learning environment in the classroom facilitate stronger preparation for the workforce.

Hurtado and Kamimura (2003) point to faculty of color (Latina/o specifically, in their chapter) as forms of structural support for student success, especially faculty of marginalized identities. In addition, they contend that:

> These individuals [faculty] represent role models who have successfully overcome the challenges of being "one of few" in postsecondary education. They serve as mentors in assisting [Latino] students to navigate the system and provide resources to enhance scholarship and academic achievement (p. 147).

As researchers, compositionally diverse teams have been shown to innovate and problem-solve more effectively than homogenous teams (Hambrick, Cho, and Chen, 1996; Page, 2008). Moreover, diverse faculty can draw insights from their varied experiences and contribute to the overall innovation and learning on a team (Kamimura & Posselt, 2016). Coleman (2010) concurs that "tapping the talents and interests of women as well as men into STEM disciplines…is part of the solution for our continued competitiveness in a global economy based on innovation and technology" (p. xiii). Anaya and Cole (2003) remind campus leaders that faculty are the *constant* on campus. While waves of students come and go, faculty are the constant that hold the academic institution together over time. Therefore, shaping the composition of the faculty to help sustain the mission of our campuses and the needs of our changing national student demographic is critical in fostering an educational environment where all – students, faculty, and staff – can flourish. This benefit of diverse faculty framing encourages a key question: What aspects of their policies and practices can campuses and their respective departments change to help increase structural diversity of faculty?

Inequities in the Professoriate.

Research attention on issues of access and equity has primarily focused on undergraduate and graduate students (Bowen, Bok & Shulman, 1998; Garces, 2012; Jayakumar & Garces, 2015; Posselt, Jaquette, Bielby & Bastedo, 2012; Winkle-Wagner & Locks, 2013; Yosso, Parker, Solórzano & Lynn, 2004), but there is less research focus on access to the professoriate. Moreover, national news has followed student protests on campuses (Berrett, 2015a; Berrett, 2015b; Brown, 2015a; Brown, 2015b; Livingston, 2015) where students are making demands of institutional leadership, including the hiring, retention, and equitable compensation of more diverse faculty. These campus-based demands have fueled students on more than 70 campuses

across the country to join a student movement known as The Demands (thedemands.org), which collectively presses campuses for more inclusivity overall but with particular attention on the professoriate.

In spite of the shifting demographics indicating that groups such as Latina/os have grown at remarkable rates nationally from a mere 4.5% in 1970 to 16.3% of the national population in 2010 (Núñez, Hurtado, Calderón Galdeano, 2015), with a projected 30% of the U.S. residents by 2050 (Saenz, 2010), of those Latina/os who pursue higher education, approximately 7% are awarded bachelor's degrees after six years of first-time college enrollment (Gándara & Contreras, 2009). While these are simply the statistics for one population, the data for all other marginalized populations appears similar, thus reflecting the slow progress on undergraduate and graduate student access. However, when we consider the next junction in the pipeline – the professoriate – campuses and disciplines are lagging far behind the demographic changes. The data on faculty composition indicate that 40.0% of all U.S. tenure track or tenured faculty are female,[1] and only 19.2% of all U.S. tenure track or tenured faculty are underrepresented minorities (NSPF, 2011; U.S. Department of Education). Accordingly, only 10.3% of faculty who have achieved full professor status are women, and merely 3.6% are faculty of color (NSPF, 2011; U.S. Department of Education). Although the numbers vary somewhat across fields and institutional types, the underrepresentation of both women and faculty of color continues to be a national problem (Allen, Epps, Guillory, Suh, Bonous-Hammarth, & Stassen, 2002), as academia overwhelmingly remains homogeneous.

The Gap Widens: Inequities in STEM Professoriate.

[1] Although it is recognized that gender is not a binary construct (i.e., male and female only) (Butler, 1990; Linstead & Pullen, 2006), national data are gathered along these binary measures.

The inequities in the professoriate are visible in a range of disciplines however, they are collectively most pronounced in science, technology, engineering, and mathematics (STEM). According to the National Science Foundation, in 2013, 354,000 faculty (i.e. teaching, research, and adjunct faculty) at universities and 4-year colleges were hired within a STEM program (NCSES, 2013). Of these faculty, 34% were women. Only 9.6% of these faculty were of an underrepresented racial/ethnic identity, less than half of the fraction of faculty of color in all disciplines. Furthermore, when these data are disaggregated by position, the inequities increase for part-time faculty. For instance, 42% of women in academia are part-time faculty, which represent the least stable positions in the professoriate. Moreover, in STEM, women are about 6% less likely to be hired into a faculty position than in other academic fields, while STEM faculty of color are hired at a nearly 10% lower rate than in other disciplinary fields (NCSES, 2013). When the national averages are already low for underrepresented faculty, these discrepancies signal an extra wide and persistent gap for female and racially/ethnically diverse faculty in STEM disciplines.

Recently, however, national efforts in selected STEM disciplines such as chemistry have raised attention to diversity. For example, in 2007, the Board of Directors of the American Chemical Society (ACS), the world's largest scientific society, adopted a diversity statement stressing its commitment. They wrote, "To remain the premier chemical organization that promotes innovation and advances the chemical sciences requires the empowerment of a diverse and inclusive community of highly skilled chemical professionals." The data indicate that the field continues to struggle with diversity along gender and racial/ethnic lines. In 2013, 23.6% of the total number of doctorates in chemistry were awarded to graduates of color, and 39.7% to women (NSF, 2013). This represents a small gain in female doctorates awarded (i.e., 7.6%

increase) from 2003-2013 with (NSF, 2013). The disparity grows deeper in the transition between doctoral-degree attainment and the professoriate. As reported by the National Science Foundation, of the 28,300 full-time tenure track faculty or those in tenured physical science[2] (of which chemistry is *one* of the disciplines included) , 22.3% are female, and only 5.7% are faculty of color (NCSES, 2013; National Science Foundation, 2013). Therefore, even though the field has experienced small gains in doctoral production, the inequities in the professoriate persist.

Similarly, of the 46,700 tenure track or tenured faculty in the biological/life sciences, 18.6% are women and 7.9% are faculty of color (NCSES, 2013; National Science Foundation). Even in the biological/life sciences, which have traditionally been recognized for having more women faculty than other STEM fields, these data point to possible structural barriers of sexism and racism that continue to perpetuate the inequalities for women and people of color in the academy. Despite national pressure by organizations such as ACS, by the shifting demographics, and by campus unrest all pressing higher education institutions to diversify the professoriate, severe inequity gaps seem to have widened rather than narrowed for women and faculty of color.

Institutional Options for Equity: Do Any Exist?

In a political environment in which fear of litigation regarding affirmative action and other targeted diversification practices is of high concern, many institutions often claim that their "hands are tied" by restrictive hiring policies. In recent history, few policy changes in higher education have garnered as much attention as affirmative action and diversity (Gaertner & Hart, 2013; Hurtado, Milem, Clayton-Pedersen, & Allen, 1998; Tierney, 2007), partially due to the

[2] Physical science includes the following disciplines: astronomy, chemistry, physics, and other physical sciences (NSF, 2012a).

contentious discourse on this topic. Despite the lack of agreement, structural diversity (i.e., the numerical representation of these groups) of students and faculty is viewed as important to higher education learning (Chang, 1999; Gurin, Dey, Hurtado, & Gurin, 2002; Hurtado, 2001, 2005, 2007; Springer, 2002). Springer (2002) extends the rationale for increased structural diversity (of faculty) beyond the traditional *educational benefit*s of diversity (Hurtado, 2007; Gurin et al., 2002) by highlighting that hiring a diverse faculty also protects an institution against litigation for discriminatory hiring practices against minorities and for the opposite perspective of reverse discrimination. While 8 states have passed a restrictive referendum regarding the use of social identities, such as race/ethnicity and gender, in hiring practices,[3] Springer (2002) outlines three permissible primary strategies for hiring faculty of color within the parameters of the law, including race-conscious recruiting/outreach, search committee education/training, and faculty retention efforts. Contrary to popular belief, the "courts have found race conscious recruiting acceptable under all of the different standards. Taking steps to increase the pool of qualified applicants increases chances for a diverse candidate, and exposes the institution to a broader pool of talent" (p. 10). Moreover, faculty who serve on search committees may be experts in their academic areas; however, few are experts in hiring policies or the forms of bias that influence the hiring process, and most can benefit from additional training in these areas prior to serving on a search committee (Springer, 2002). Therefore, even though institutions may feel restrained or even paralyzed by the restrictive hiring laws, Springer (2002) argues that

[3] Several states have passed state initiatives prohibiting the use of race in admission processes. These state initiatives are: California's SP-1 (1995) and Proposition 209 (in 1996), Washington's Initiative 200 (1998), Michigan's Proposition 2 (2006), Nebraska's Initiative 424 (2008), Arizona's Proposition 107 (2010), New Hampshire's House Bill 0623 (2011), and Oklahoma's State Question 759 (2012). These initiatives generally eliminate the use of preferential treatment and prohibit the use of discrimination based on race, color, sex, ethnicity or national origin in the operation of public employment, education, or contracting.

campuses should utilize recruitment and committee training strategies as opportunities for hiring underrepresented faculty, thus "untying" their hands in pursuit of their goal.

Recruitment and Hiring Processes: The Professoriate Point of Access.

Scholars have argued that gender and racial/ethnic inequities in the professoriate are perpetuated, at least in part, through implicitly biased search, hiring, and promotional processes (Alger, 2000; Chused, 1988; Delgado-Romero, Manlove, Manlove & Hernandez, 2007; Kayes, 2006; Knowles & Harleston, 1997; Lee & Janda, 2006; Light, 1994; Moody, 1988; Opp & Smith, 1994; Reyes & Halcon, 1988; Smith, 2000; Smith, Turner, Osei-Kofi & Richards, 2004; Stewart, Malley & LaVaque-Manty, 2010; Tuitt, Sagaria & Turner, 2007; Turner, González & Wood, 2008). Frequently, academic departments lack professional development to see their own implicit biases and the implications those biases may have on application review and interview processes (Delgado-Romero et al., 2007; Kayes, 2006). Moreover, departments lack the resources (i.e. financial and social networks) to broaden the advertising and recruiting efforts, which lack leads to similarly homogeneous pools (Alger, 2000; Knowles & Harleston, 1997). However, various scholars argue that a majority of the bias enters the hiring process when evaluating a potential faculty candidate for "fit" (Delgado-Romero et al., 2007; Kayes, 2006; Knowles & Harleston, 1997). This is regularly a time when faculty assess whether the candidate will make a "good" colleague, whom they can collaborate with, and whose research they value. Under these subjective conditions, faculty exhibit tendencies of homophily, namely that they have an affinity for individuals that mirror themselves (Lazarsfeld & Merton, 1954 as cited in McPherson, Smith-Lovin & Cook, 2001). [4, 5]

[4] Similar tendencies are observed in the graduate admissions processes, as faculty seek students that resemble themselves (Posselt, 2015) and in hiring within investment firms (Rivera, 2015).

Cases of Positive Deviance.

How can academic departments change recruitment and hiring practices? Are there places they can turn to for guidance? Indeed, isolated cases of innovative and intentional hiring practices to change these inequities have shown positive outcomes for some science and engineering departments across the country (Raber, 2010; Stewart, LaVaque-Manty & Malley, 2004; Stewart et al., 2010). For example, in an article in *Chemical & Engineering News*, Raber (2010) highlighted the success of several Chemistry departments that have hired more women faculty. She discussed the fact that Purdue University has the largest Chemistry faculty in the nation, and consistently rose to the top on proportions of women to men faculty, with 29% of their faculty identifying as women, and was expected to continue growing in these proportions.

Some departments are making progress along gender lines in the hiring of their faculty while others have made progress along racial lines. These instances do not offer generalizable evidence, but they do provide insight on what might be working. Studies that identify promising strategies are also useful in developing policy and programmatic interventions that can be implemented and evaluated through quantitative methods. Patton (2014) urged higher education scholars to conduct more strengths-based studies to shed light on success stories, specifically in STEM, from which campus and departmental leaders can learn. As leaders seek insight from those who are making progress, they begin to imagine possibilities for their own units.

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[5] Although a significant amount of the literature focuses on the biases present in the hiring process, biases in the promotion to tenure processes also exacerbate the inequities for marginalized individuals, thus broadening the inequality for faculty (Alger, 2000; Cora-Bramble, 2006; Delgado-Romero et al., 2007; Knowles & Harleston, 1997). These inequities persist even when scholars, such as Smith (2009), have made a strong case for faculty diversity as critical for institutional vitality and viability.

In many ways, these isolated cases are examples of positive deviance within STEM. As Lavine (2012) delineates:

> Positive deviance (PD) focuses our attention on the extreme end of the positive spectrum, to the uncommon cases that represent unusually successful behaviors amid unlikely odds…Positive deviance involves people [or organizations] behaving in ways that notably depart from expected norms, albeit in a direction that some group of others (i.e., a referent group) finds positive (p. 1014).

Hence these cases of positive deviance serve as glimmers of hope that *progress* toward equity in the professoriate is possible.

As the gender and racial/ethnic inequities in the STEM professoriate persist, the disparity – between the number of doctorates received and those holding tenured/tenure-track positions attained by women and people of color – highlights the search process as the gatekeeping access point to academia. Springer (2002) reminds organizations that are working toward diversifying their faculty to capitalize on the recruitment stage of the faculty hiring process, as this is a critical junction for positive change.

Research Questions

While campus-level diversification approaches have been well documented (Arnold & Kowalski-Braun, 2011; Banerji, 2005; Collins, 2011; Gaertner & Hart, 2013; Goldsmith, 2000; Gose, 2006; Griffin, Muñiz & Espinosa, 2012; Kahlenberg, 1996; Laguardia, 1998; Marin & Lee, 2003; Thompson & Tobias, 2000; Timar, Ogawa & Orillion, 2004; Ward, 2009; Williams, 2008; Williams & Cox, 1991; Williams & Wade-Golden, 2007), it is less clear *how* and *why*

exemplary departments have made changes in recruiting and hiring diverse faculty, and what might be gleaned from their efforts.

The goal of this research is to identify promising practices for enhancing structural diversity in the professoriate, with a focus on search and hiring practices in STEM disciplines where women and people of color are underrepresented. The overarching question for this study is: *What approaches do STEM departments take that are working to attract more women faculty and/or faculty of color than their disciplinary counterparts?*

The following sub-questions guide my response to this main question:

1. What have STEM deans and/or department chairs of units that reflect positive deviant tendencies done to motivate change in faculty recruitment and hiring practices?
2. Does the wording of job postings affect the composition of the applicant pool, and of who is hired, in STEM departments?

Key Terminology

In my study, I investigate social constructs such as diversity, equity, and access for marginalized populations, constructs that are frequently referenced in daily conversations, yet in academia carry distinct conceptual frameworks and supporting literature to substantiate one understanding over another. For this study, a common understanding of the key terminology underlying the premise of the investigation is imperative to understanding the proposed concepts, foundational literature, and ultimate findings and implications. This section will define several of the most critical terms for this study, including diverse populations, organizational capacity building, and structural diversity.

Diverse Populations.

The higher education literature traditionally defines racial/ethnically diverse populations and/or individuals as those who are of African American/Black, Native American/Indigenous and Chicanx/a/o/Latinx/a/o/Hispanic[6] heritage. Moreover, the extant literature on historically underrepresented faculty also focuses primarily on these populations (Smith, Turner, Osei-Kofi & Richards, 2004). The literature does differ on the inclusion of Asian Americans as diverse or underrepresented (Park & Liu, 2014), primarily dependent on the context in which the individual or group is being considered. Furthermore, while there is a larger proportion of Asian American students enrolled and faculty hired at some elite campuses, this perception perpetuates an inequitable of the diversity and representation among all Asian Americans[7] in higher education, especially of Southeast Asian Americans who are drastically underrepresented in higher education overall (Park, 2013). As is also the case with the all other racial/ethnic groups, the clustering of such diverse populations conceals the uneven distribution of Asian Americans across higher education and in various roles (i.e., students, faculty, staff). However, due to the problematic conflated categories, Asian Americans are overall not underrepresented in most

[6] More recently, the more representation of the previously identified Latina/o ethnic group now also includes Latinx, symbolizing an inclusivity of gender non-conforming and sexual orientation.

[7] Asian-American (also referred to as Asian/Pacific Islander American) is inclusive of over 25 cultural groups due to their ethnic decadence with Asian and/or the Pacific Island, and what have been designated through sociological constructs as physical similarities and cultural values. These groups include: Cambidian, Chinese, Filipino, Guamanians, Hmong, Indonesians, Japanese, Korean, Lao, Mien, Samoans, Southeast Indian, Thais, Vietnamese, etc. (Uba, 1994).

STEM disciplines. Therefore, in studies within STEM disciplines, such as this study[8], Asian Americans will not be included when discussing diverse populations.

Beyond race and ethnicity, other social identities (such as gender), also have a history of marginalization and underrepresentation in some disciplines. For example, women are significantly underrepresented in many STEM areas. Therefore, when STEM departments consider the diversification of their academic areas, they generally include practices for increasing the representation of women and racially/ethnically historically underrepresented people.

The terms people/faculty of color, underrepresented, minoritized, and marginalized will be used in this study to refer to the racially/ethnically underrepresented faculty in STEM. This includes people whose ancestry is categorized as African American/Black, Chicanx/a/o/Latinx/a/o/Hispanic, and Native American/Indigenous. While under most circumstances conflating these terms for these distinct populations is problematic, all of these categories properly align with the experiences of faculty of color in STEM. The literature indicates that their experiences as inequitably represented, often led to feelings of marginalization (Griffin et al., 2011a, b; Moreno et al., 2006).

Strengths-Based.

Strengthens-based research has primarily centered around identifying and developing individual and organizational skills deriving from a philosophy of *what works* as opposed to *what is broken* or the deficit. The philosophical underpinnings of strengths-based work have primarily been written about in popular press as a form of helping individuals (i.e., students,

[8] This is a limitation of this study, as the data collected were only available as an aggregate group. In future studies, the disaggregation of Asian American faculty could lead to new insights.

leaders, etc.) identify their strengths through the CliftonStrengths (Gallup, 2017) and StrengthsFinder (Clifton & Buckingham, 2001; Rath, 2007) assessments. The premise of strengths-based work lies in understanding how to "turn[…] unique talents into strengths [through] require[d] skills, knowledge, conscious effort, and deliberate action " (Gallup, 2017, p. 10). As the recognized Father of Strengths Psychology, much of Clifton's research focused on helping individuals "become more of who they already are" as a key to revealing their path toward success (Gallup, 2017, p. 10). As this popular press gained traction, the individualized concept became anthropomorphized to organizational levels. Thus organizational strengths-based research similarly focuses on honing in on "knowledge, skills, and practice" around specific phenomena until "near-perfect performances" are achieved, signaling the development of an organizational strength (Gallup, 2017, p. 12). With a strengths-based conceptualization in mind, this study investigates how STEM units have developed diverse approaches to effectively attract more women faculty and/or faculty of color.

Structural Diversity.

The higher education literature defines structural diversity as the "numerical representation of diverse groups" (Bowman, 2012; Clarke & Antonio, 2012; Cole, 2007; Gurin et al., 2002, p. 333; Hurtado et al., 1998; Jayakumar, 2008) also sometimes referenced as compositional diversity in the literature (Page, 2008). The assumption is that having more students of color is a desired campus characteristic, primarily due to the higher probabilities for interactions with individuals or groups of different racial/ethnic backgrounds (Bowman, 2012; Gurin, Dey, Hurtado & Gurin, 2002; Hurtado, 2007). Empirical evidence suggests that interactions amongst diverse groups and individuals provide stronger learning opportunities and increased rates of retention (Chang, 1999; Gurin et al., 2002).

Contributions of the Research

Motivated by the slow developments within academia, the persisting inequities amongst STEM faculty create an urgent call to action. The contributions from this study are two-fold: empirical and pragmatic. Answering this call to action and providing insights for departments seeking change are guiding principles of the foundation of this study.

Few empirical studies on diversification efforts focus on strategies for success or "what works"; rather, more studies tend to investigate the status of equity through a portrayal of inequities in the system (Astin & Oseguera, 2004). Most studies tend to investigate the state of inequality of women faculty and faculty of color, but none to date have empirically studied approaches that have produced positive gains (by attracting more diverse faculty). This study leverages a strengths-based conceptual framework for understanding organizational routines through the Competing Values Framework (further discussed in Chapter II) that provide insights into how STEM departments/schools are working to increase their faculty's structural diversity. Furthermore, the empirical literature on diversification strategies such as recruitment and hiring practices of women faculty and faculty of color is even more limited, and often focuses on qualitative or quantitative measures only, leaving a gap in the implications. Overall, this mixed-methods study (further discussion of the research design and methodology is discussed in Chapter III) aims to fill these empirical gaps.

Pragmatically, this study will contribute to the field of higher education by providing approaches that STEM departments might implement when attempting to attract more women faculty and/or faculty of color. My hope is that this study provides insights into how higher

education can begin to create change, even in areas such as diversification of STEM faculty that have long been fraught with failure, and to provide insights into how campuses and departments may begin to "untie their hands" and meet the needs of an increasingly diverse nation.

Summary

In conclusion, this chapter makes clear that the inequalities in the STEM professoriate persist in spite of focused efforts and an increase in doctorates by women and people of color (NCSES, 2013; National Science Foundation; Stewart et al., 2010). While institutions may feel as though "their hands are tied" by restrictive legislation, Springer (2002) suggests that departments should consider distinct stages in the hiring process – specifically recruitment and outreach – as opportunities to reconsider ways to *untie their hands*. Isolated cases of positive deviance that have been noted in STEM departments have shown promise while successfully attracting more women faculty and/or faculty of color (Raber, 2010; Stewart, LaVaque-Manty & Malley, 2004; Stewart et al., 2010). For this reason, this study, in a methodological design that has not previously been explored (i.e., convergent parallel mixed methods design), seeks to better understand the approaches taken by STEM departments that attract more women faculty and/or faculty of color than their disciplinary counterparts.

Chapter II situates this study in the context of the extant higher education literature on diversification efforts for STEM faculty, in addition to the conceptual framework leveraged for understanding organizational routines through the CVF, as a tool to guide this study and map the findings. Based on the literature and conceptual framework, Chapter III details the research design identified to best investigate the research questions outlined in this chapter.

Chapter II: Literature Review & Conceptual Framework

Overview

As discussed in Chapter I, inequalities in STEM faculty persist – along both gender and racial/ethnic lines. In attempts to better understand the reasons for the persistence of this inequity, several rationales have been considered, including lack of a diverse pool of candidates (Kayes, 2006; Turner, 2002), unconscious bias within the search and hiring process (Kayes, 2006; Smith, 2000; Stewart, Malley, & LaVaque-Manty, 2010; Turner, 2002), lack of retention of diverse faculty (Kulis, Chong & Shaw, 1999; Moreno, Smith, Clayton-Pedersen, Parker & Teraguchi, 2006), and evaluation bias in the promotion and tenure process (Turner, González & Wood, 2008). However, studies have indicated that the argument of an insufficient pool, specifically of STEM PhDs of color, is indeed a myth (Kayes, 2006; Olivas, 1998, Turner, 2002). Furthermore, while retention and promotion to tenure are critical to sustaining a diverse faculty, studies have identified recruitment and hiring processes as a gatekeeper in the pathway from the doctorate to the professoriate (Bilimora & Buch, 2010; Olivas, 1988).

As such, it is critical to understand, not only, the literature on compositional diversity of faculty in STEM, but also the literature on the search and hiring process for faculty, broadly, in order to develop new pathways toward equity in the STEM professoriate. The first section of this chapter expands on the current inequities in the STEM professoriate that point directly to recruiting and hiring as a pivotal gatekeeper. The second section discusses the context of the search process (with special focus on recruitment and hiring) and significant focal points that

scholars suggested for faculty diversification efforts. The third section follows with a critical analysis (inclusive of contributions relevant to this study and gaps in) the literature regarding aspects that are significant and contingent to the faculty search process.

This chapter concludes with the introduction of a theoretical reconceptualization of the Competing Values Framework (CVF) presented as a model to better understand organizational routines as a mechanism for studying effective recruitment and hiring strategies for women faculty and/or faculty of color in STEM. This section will provide an overview of the organizational routines theory as an introduction to the opportunity it provides for change in the faculty diversification process, and of the CVF as a model to help understand the variations in approaches that may be taken in working toward attracting more women faculty and/or faculty of color. Thus a reconceptualization of the CVF, with organizational routines theory at the intersection, will be introduced in this final section as an analytic tool in understanding the findings presented in this study.

Contextualizing a Path Toward Equity in the STEM Professoriate

The extant higher education literature on the inequalities in STEM faculty primarily focuses on two areas: compositional inequalities and inequalities in faculty experiences. The literature on compositional diversity primarily argues that the number and proportions of women faculty and faculty of color in STEM are disproportionately low in comparison to their male and racial/ethnic majority faculty counterparts (Burrelli, 2008; Turner et al., 2008), thus inequitable. Whereas the literature on experiences dives more deeply into the marginalizing climate and individual experiences that underrepresented faculty endure once employed (Greene & Stockard, 2010; Griffin, Bennett & Harris, 2011; Griffin, Pifer, Humphrey & Hazelwood, 2011; Reyes &

Halcon; Stanley, 2006). The climate literature is not clustered distinctly around STEM faculty experience, instead is a broader body of literature that reflects marginalized faculty narratives that are generalizable across disciplines.

Insights from the Field: Impetus for the Inequitable Representation in STEM Faculty

In recognizing the widespread inequities in the STEM professoriate across gender and race/ethnicity, higher education scholars have offered insights as to why this inequity may persist. Brickhouse, Carter, and Scantlebury (1990) pointed to concerns in STEM training (prior to the professoriate), indicating that pedagogies are generally non-inclusive and do not encourage women, especially, to persist in STEM programs. Similarly, Towns (2010) suggested that there is a perpetual cycle between underrepresented students and faculty in STEM, specifically. Towns indicated that students are needing role models in during their educational training to persist; however, since there are such low numbers of women, and especially women of color in STEM, faculty, this low representation of diverse faculty impacts the perpetuation of lower numbers of women, and women of color, doctoral graduates in STEM. Furthermore, Burrelli (2008) offered a reflection on the impact of low proportions of women in full professors ranks, overall, as compared to the number of PhDs offered nationally. Burrelli (2008) highlighted this inequity as critical due to the stronger stance that senior versus junior faculty tend to take on challenging issues, such as diversity.

The reflections these educators offered underscore the question as to where the break in the pathway to the professoriate may be occurring. These considerations highlighted the complexity of the issue and the varies weaknesses that persist in supporting more women and people of color in pursuing a career in the STEM professoriate.

Practice-Based Recommendations for the Implementation of a More Equitable Search Process

While the issue of inequitable representation in the STEM faculty is complex, and the rationales for the inequities are equally complex, as was discussed in Chapter I, the search process – more specifically the recruitment and hiring process – in traditional hiring opportunities is one gatekeeping point that many educators have focused on. Thus, scholars and educators have drawn from their experience to provide several recommendations to department/schools looking to recruit and hire more women faculty and/or faculty of color. Noteworthy, these recommendations are broad based and not specific to STEM departments/schools, but can be generalized to also contextualize considerations for STEM.

Although recruitment and hiring is commonly conceptualized within specific parameters of a search process, practioners and administrators are urged to consider recruitment as a daily function (Light, 1994). In this article, Light (1994) suggested that hiring departments should focus on their organizational climate first as a positive climate will become a self-generating engine for recruitment. Although the recommendation to turn inward and focus on organizational climate is critical, this process should not exclude working on the search process concurrently (Kayes, 2006). Most other recommendations spoke specifically to aspects within the search process.

On many campuses, a traditional search process has several steps, including: selection of the search committee, job posting, interviewing, and hiring. Scholars, such as Turner (2002), have drawn from their research to develop handbooks filled with recommendations for successful hiring faculty of color. In her handbook, Turner (2002) noted the importance of

leadership prior to the start of the formal search, the importance of the composition of the search committee, suggestions for increasing the diversity of the applicant pool through job postings, and recommendations for learning about the ways to eliminate unconscious bias from the review process as best as possible. She placed a significant focus on the role of leadership in guiding this process; however, Kayes (2006) recommended that departments and campuses need more than espoused values from institutional leadership, in order to overturn the concept of "diversity hires." This concept of "diversity hires" insinuates that the person was only hired for their social identity (i.e., gender, race/ethnicity) not their scholarship, and only serves to perpetuate the myth that an inadequate pool of applicants exists. Thus returning the focus to the scholar's academic contributions leads to the greatest results in hiring (Tuitt, Sagaria, & Turner, 2007). Furthermore, recommendations that effective hiring of diverse faculty requires full departmental engagement, not just the search committee (Bilimora & Buch, 2010), alongside changes to the evaluation process that are more inclusive of a broadened scope of research specialization allowing for applicants and faculty can be assessed on the diverse contributions of their work, not on previous conceptualizations of merit (Alger, 2000). Overall, as Smith (2000) highlighted in an editorial, in order for departments/schools to achieve different results, they must be willing to try something different. Based on her scholarship, she suggested transforming recruitment and hiring practices as the point of focus.

Research on the Faculty Search Process for Enhanced Compositional Diversity

As the prior scholars and educators have recommended, focusing on the recruitment and hiring process as a starting point toward equity in the professoriate (STEM professoriate, in the case of this study). This section will discuss the extant empirical literature that substantiates the

rationale for enhancing compositional diversity of STEM faculty through transformative practices in recruitment and hiring could lead toward progress, and eventually equity in the professoriate. The extant literature has focused on 3 primary areas around the hiring of underrepresented faculty: barriers impacting the recruitment and hiring of underrepresented faculty, the recruitment and hiring process (itself), and the role of leadership in creating change in the recruitment and hiring process. The following sections will discuss these areas in further detail.

Barriers Impacting the Recruitment and Hiring of Underrepresented Faculty

Prior to the formal recruitment and hiring process begins, faculty contend with other factors that can impact the probability of hiring an underrepresented faculty member for an open position. Perhaps one of the most common misconceptions that scholars have worked to demystify is the myth that the amount of qualified applicants for faculty positions, that are also women and/or people of color, is low (Olivas, 1988; Smith, 2000; Turner, Myers, & Creswell, 1999). While this understanding is an overall myth, there is evidence the pool of compositionally diverse applicants may be shallower than hoped for various reasons.

In a case study analysis on 8 Midwestern campuses, Turner and colleagues (1999) focused on interviewing faculty of color on these campuses and understanding the factors that these faculty believe are leading to the underrepresentation of faculty of color, broadly across all disciplines. Turner and colleagues (1999) identified 3 factors that explain the inequity of faculty of color on colleges campuses: 1) the pipeline problem, 2) the market-forces problem, and 3) the "chilly climate" problem. While there are slightly more students of color admitted to doctoral programs in all disciplines, the growth rate has lagged behind due to a variety of reasons

including exclusionary admission practices (Posselt, 2016), thus leading to what Turner and colleagues referred to as the "pipeline problem." The "market-force problem" develops from the force that pulls graduates of color, in particular, toward higher paying jobs (Turner et al., 1999). Based on their calculations, at the time of their study, the market salary for a PhD graduate was significantly higher, thus more enticing, than a faculty salary in the Midwest. Therefore, this "market-force pull" negatively impacts the depth of applicants of color for faculty positions. Finally, the "chilly climate" factor pointed to the negative experiences that faculty of color have while working in exclusionary environments, in facing additional barriers during promotion and tenure (such as "being told they did not fit the 'profile' of someone to be promoted"), and perceiving "being in the spotlight" (Turner et al., 1999, p. 41-42). Therefore, while the rationale that the pool of qualified applicants of color is too shallow may be a myth, there are several substantiated reasons that do impact the lower numbers of applicants of color to faculty positions. This case study provided an in-depth qualitative analysis that provides great insights as to why some STEM pools may not be as diverse as hiring units may want them to be; however, since this case study was broadly conducted on all disciplines, and only in the Midwest, it begs the question whether some of these issues are more prevalent in certain STEM areas versus others. Disciplinary context can vary findings, and as qualitative work is so context specific (Merriam, 2009), context does need to be considered.

To further substantiate the myth of inadequate pools of faculty of color, Chused (1988) argued that many of the excuses for the lack of diversity amongst law faculty are no longer relevant. Through his study, focused on better understanding the hiring and retention trends of women and minority faculty of law, he demonstrated the disproportionate rates at which women were hired into lower ranking teaching positions and showed higher incidences of departure.

Faculty of color also exemplified similar patterns. Furthermore, this study highlighted that sufficient numbers of qualified women and minorities are graduating, thus are eligible for faculty positions. Therefore indicating that the rationale of "unavailability of qualified applicant(s)" did not hold true (Chused, 1988, p. 555). Thus, Chused (1988) argued that if a compositionally diversified faculty is the desired outcome, departments must replace the excuses with:

> commitment, devotion of time, willingness to confess error, conscious devotion to finding and using new methods for recruiting faculty…and frequently articulated, strongly worded public statements by senior faculty, deans, and university presidents that diversity is a matter of the highest priority. (p. 555)

Chused (1988) posited the need for immediate change and contended that efforts must be intentional and forthright. While further substantiating the fallacy of the myth of lack of qualified applicants of color, Chused's study (1988) pointed to significant factors influencing the hiring of faculty of color, including: intentionality, focused resources, and the role of leadership. However, in light of this study, it is important to note that the alignment of diversity with law as a discipline is often easier to find, as compared to STEM disciplines. In addition, the climate in each discipline, and each department is distinct leading to differentiated rates of retention/attrition. Therefore, the context of this study is critical to the application of the findings.

As was contextualized previously, and empirical evidence supports (Turner et al., 1999), organizational climate is a critical factor influencing the inequity in the professoriate. A significant amount of research has been conducted to understand the experiences of underrepresented faculty, especially faculty of color. Scholars have stipulated that a major issue that perpetuates the inequity in the professoriate for faculty of color stems from the *revolving*

door syndrome (Moreno et al., 2006). Moreno and colleagues (2006) studied the inequities in the professoriate and argued that the attrition of faculty of color was so significant, that in spite of concerted efforts to hire more faculty of color, departments were simply creating a *revolving door* of faculty of color – as they would lose one, they would gain one, so to speak. Therefore the high attrition rates were prohibiting any progress in enhancing the numbers of faculty of color. Scholars argue that the "chilly climate" (Turner et al., 1999) and inequitable experiences lead to high attrition amongst faculty of color, in particular (Greene & Stockard, 2010; Griffin & Reddick, 2011; Griffin et al., 2011a; Griffin et al., 2011b; Niemann, 1999; Reyes & Halcon, 1988; Stanley, 2006; Turner et al., 2011).

Greene and Stockard (2010) examined women faculty's perceptions of gender-related climate within academia, especially within chemistry in which women faculty are significantly underrepresented. They found that work climate was perceived as "problematic and less than welcoming" by women faculty, as evidenced by the substantial differences in the resources allocated to men and women, including: salaries, workload, workspace, and recognition for research (Greene & Stockard, 2010, p. 381). Other scholars have pointed to the microaggressions that faculty of color, in particular, contend with on a daily basis (Griffin et al., 2011b; Reyes & Halcon, 1988), in addition to the marginalization that is experienced through racism and cultural taxation (Griffin et al., 2011a). These works also spoke to the impacts of sexism on women of color as conflating stressors (Griffin et al., 2011a, b). While these studies focused specifically on faculty of color and their experiences across varied disciplines, the findings speak to some of the reasons why focusing on organizational climate can be so important in enhancing the compositional diversity of STEM faculty. As noted by focusing inward, departments can create a more inclusive environment that supports the success of all faculty, and helping to address the

revolving door syndrome (Greene & Stockard, 2010; Griffin et al., 2011a, b; Moreno et al., 2006; Reyes & Halcon, 1988). The caveat that these studies did not formally address was the impact that the higher retention could have as a recruitment tool. Moreno and colleagues (2006) addressed stopping the *revolving door*, but did not speak to the impact that if by retaining more faculty of color, could that serve as a recruitment tool in itself.

The Recruitment and Hiring Process: Identified Gaps and Opportunities

As challenges that lie outside of the parameters of the search process – recruitment and hiring as the focus of this study – have shown to impact the overarching goal of enhancing the compositional faculty, it is critical to understand the insights gained from the empirical research on the process. As studying the entire search process in-depth is often a challenge due to time and resources, most studies focus on a distinct step of the search process. Collectively, the findings across these studies provide a broader perspective on the varied approaches aimed at creating change in the faculty recruitment and hiring process for equity.

Changing the Recruitment and Hiring Process for Equity. As is noted a foundation of work on diversity, but especially in work on hiring a more diverse faculty, intentionality is at the core of success (Stewart et al., 2004). As Stewart and colleagues (2004) argue that buying into the myth of the inadequate pool is simply from lack of trying. The pool of applicants will not automatically become diverse without extra effort, therefore intentionality around how to enhance the diversity is a necessary focus (Stewart et al., 2004). Their extensive qualitative research on STEM departments on one Midwestern campus, also signaled that intentionality around committee member composition, requiring all search committee members to engage in unconscious bias training, creating broad versus narrow searches (e.g., broad in regards to

research specialization), and the inclusion of diversity statements in the job postings, are critical for in working toward successfully hiring more women faculty in STEM. In particular, a significant emphasis on broadening the scope of the search, beyond very narrow curricular and/or research gaps, provides a mechanism for moving away from homophily (Knowles & Harleston, 1997).

Intentionality in the recruitment and hiring process has also been shown to be impactful when the process accounts for the challenges that faculty of color may experience once they are hired. More specifically, research indicated that faculty of color contend with additional challenging in these areas: teaching, mentoring, collegiality, identity, service, and racism (Stanley, 2006). In this autoethnographic study of 27 faculty of color across all ranks and disciplines on a predominantly White campus, faculty were asked at the end of the study to provide recommendations for enhancing the experiences and recruitment opportunities for faculty of color broadly. The 6 areas listed where the themed findings that the faculty recommended to current and prospective faculty, and also administrators overseeing their departments. As such, these faculty recommended that resolutions to the following issues be addressed in the recruitment and hiring process: challenges that may arise during promotion and tenure regarding negative student evaluations from teaching on contentious issues of diversity, mentoring that is needed in learning the unspoken "rules of the game" in the department, issues around collegiality and identity that are assumed by the faculty member and their colleagues, how to handle the overload of service assignments (formal and informal) that faculty of color are asked to manage, and the racism that may persist by working in a predominantly White environment. Similarly to addressing the challenges that faculty of color know they will likely face while working in a predominantly White institution, scholars found that by highlighting the

benefits that the recruit might gain by taking the position, the department was more likely to have a successful hire (Barrett & Smith, 2008). These benefits included: research opportunities and research funding, career advancement opportunities, and the reputation of colleagues. While this study focused primarily on understanding the experiences of 12 African American faculty members (across disciplines) who chose to work at elite research institutions, the insights garnered from highlighting the benefits gained by joining a given department are valuable. However, once again, context is critical, thus must be considered depending on campus type and disciplinary unit.

Through a quantitative analysis at three primarily white large public elite campuses, Smith, Turner, Osei-Kofi, and Richards (2004) examined the process taken by search committees at the departmental level and the conditions that provided for the successful hiring of women and/or faculty of color. Over a three-year period these scholars collected data for all faculty hires on these five indicator variables: "job description; discipline of the appointment; race/ethnicity and gender composition of faculty hire; any special initiatives, funding sources, or interventions that were used in the search; and the institution from which the successful candidate came" (Smith et al., 2004, p. 137). Their primary hypotheses revolved around exploring whether faculty of color hires most prominently occur in cases when non-traditional hiring strategies are utilized or when the scholarly area of interest specifically involves topics of diversity (such as ethnic studies). The results supported these hypotheses and pointed to the foundational need for intentionality of efforts when attempting to hire faculty of color, especially in departments where diversity is not central to the scholarship area and on primarily white campuses. Smith et al. (2004) concluded by encouraging future research to examine similar "practices in the context of successful diversification of faculty within departments that traditionally have not been diverse"

(p. 156). This call certainly has applicability to STEM disciplines as a context for further exploration.

While most of the previously discussed research has focused on the recruitment angle of the search process, scholars have also investigated the impact of unconscious bias on the review processes that take place within the search process – namely in the review of applications. As a faculty application often has several components that are requested, including: letter of interest, curriculum vitae, letters of recommendation, and transcripts. As scholars have found, at each of these stages, unconscious bias can create an inequitable stance especially for underrepresented faculty. For instance, Bedeian and Feild (1980) argue that one unconscious mechanism that committee use to perpetuate homophily is through the evaluation of prestige of doctoral-granting institution of the applicant. Therefore, if the applicant did not attend what is deemed as a prestigious institution for their doctoral training, then they are quickly dismissed as not well-prepared; however, committees may be overlooking talented scholars that may not have had access to such institutions due to varying reasons, such as resources, social capital, familial obligations, etc. Furthermore, homophily is further perpetuated through unchecked unconscious bias that seeps into the curriculum vitae review process (Steinpris et al., 1999). Similar to Bedeian and Feild (1980) Steinpris and collegaues (1999) found that faculty were looking for colleagues that resembled their own training, publication patterns, and access to grants, thus perpetuating homogeneity amongst the faculty, even when diversity may be the expressed goal. Trix and Psenka (2003) also found that unconscious bias impacts the review process for letters of recommendation. Their findings illuminated how the way gendered stereotypes are both written and read can impact a candidate's opportunity for hire. Trix and Psenka (2003) showed that women are more often portrayed as "teachers and students," while men are depicted as

"researchers and professionals" (p. 191). Furthermore, overall letters written for women tend to be much shorter in length as compared to men, and the word choice included in women's letters of recommendation tend to raise more doubts during evaluation. Thus, these scholars all argue that since unconscious bias is so prevalent throughout the application review process, without proper training in learning how to identify these biases, inequity in the application process will persist (Bedeian & Feild, 1980; Steinpris et al., 1999; Trix & Psenka, 2003).

Thinking Outside of the Box. The previously discussed research all focuses on well-established steps within the search process that may be adjusted to encourage a more equitable process. However, Springer (2002) and Olivas (1988), both through their analyses within and about the legal discipline, provide windows of opportunity in reframing how departments/schools can think about the opportunities they have within the search process. Springer's (2002) legal analysis focuses on highlighting that Affirmative Action restrictions only prohibit the use of social identities within the hiring (i.e., evaluation of the candidate) process. He pointed to the fact that recruitment (and retention) are not stipulated in the legal parameters, and therefore should be heeded as windows of opportunity for creating change. He underscores that targeted recruitment of women and people of color is permitted within the law, simply not within the evaluation process. Furthermore, Olivas (1988) in his qualitative study in law schools identified the recruitment window as a daily function. He urges faculty to never cease recruiting, as successful recruitment (especially for underrepresented faculty) is most successful when it is an ongoing process. Thus, both of these studies point to the ripe opportunity that is present in the recruitment stage of the search process, when focusing specifically on attracting more women faculty and/or faculty of color. While both of these studies provide great insight as to where

change might take place for STEM units that are working to attract more underrepresented faculty, it is critical to note the context of these studies prior to a more broad application of this approach. Furthermore, as the context of the law changes so rapidly in our current political environment, it is important to review the legal parameters of the law. For the sake of this study, during this time, this legal window of opportunity is still present.

Role of Leadership in Creating Change in the Recruitment and Hiring Process

The intended unit of analysis for the majority of the previously discussed studies was either at the faculty level or the organizational level. However, in each of the studies there was either in inference or a direct implication for the role of leadership. Thus considering the role of leadership in motivating change is deeply important.

Role of the Department Chair[9] on Campus. Due to the sparse literature on department chairs, Chun and Evans (2015) conducted an in-depth mixed methods study focusing primarily on the contributions that department chairs make to diversity efforts on campus. They found that department chairs have a broad and influential impact over "departmental climate, recruitment & hiring of diverse faculty, and retention of minority and female tenure track faculty" (Chun & Evans, 2015, p. 16) Furthermore, department chairs often serve as boundary-spanners between the department and the university and set the tone for organizational priorities accordingly. Chun and Evans (2015) did find that one of the most significant challenges that department chairs face is in guiding colleagues to change. Due to structural norms within academe, department chairs are viewed as "on loan" as administrators (Senge, 2000, as cited in Chun & Evans, 2015, p. 46)

[9] Noteworthy, the role of department chair is the most significant in units where the hiring is localized at the department or program level; however, when hiring takes place at the school level, this role is translated over to the role of the dean.

that will return to the faculty as a colleague, therefore have little power in mandating change, but rather mobilize and guide their colleagues through change (Chun & Evans, 2015). However, they are also viewed y their faculty colleagues as the person responsible for garnering resources for the department.

Therefore, with this administrative challenge that department chairs face, Kezar (2012) argues that models of shared leadership in conducting diversity work are often the most effective. Thus, in the case of STEM department chairs needing to guide their faculty colleagues toward change in their recruitment and hiring practices, considering the models of shared leadership that Kezar (2012) explicates can be guiding principles. Furthermore, as noted throughout work on diversity, effective results cannot be gained through individualistic work. Thus Ahmed's (2012) research on diversity workers as the formal (and something informal) leaders of diversity efforts on campus helps point to the need for department chairs to identify the agents of change in their organization. As Dowd and Bensimon (2015) underscore their work on the Diversity Scorecard, the role of change agents in altering organizational routines is critical when working on diversity efforts.

Another lever that department chairs can use in mobilizing change within their departments is their positionality (Kezar, 2000). As positionality is shaped by personal social identities and life experiences related to the issue at-hand, Kezar (2000) explains that positionality is a tool that leaders can leverage to help guide their colleagues toward change. As she defined leadership's influence as: "Positioned individuals […] possessing manifested identities […] within a particular context […] influenced by conditions of power […] construct […] leadership in unique (individual level) and collective (group level) ways simultaneously"

(Kezar, 2000, p. 727). Thus this positionality, if leveraged appropriately, can be used as a tool to guide colleagues toward change on diversity issues.

Importance of Leadership in the Search Process. In understanding the power and influence that department chairs (and other campus administrators responsible for hiring) have within their units and on campus, several scholars have studied the significance of leadership within the search process, distinctly. However, when specifically dealing with hiring for a more compositionally diverse faculty (i.e., diversity effort), diversity scholars have argued that chairs/deans must lead unapologetically in naming the issues at hand. Naming the issue allows the unspeakable to become spoken and clearly addressed (Bensimon, 2005, 2010). As Ahmed (2012) addressed in her book, *On Being Included*, if campuses and leaders cannot name the issues boldly (i.e., racism) then they are truly not addressing the issue at-hand. There must be a willingness on behalf of the leadership to be bold and unapologetic in their convictions toward diversity (Ahmed, 2012; Bensimon, 2005, 2010).

These clear convictions can lead to the clarity that is required for search committees to successfully move forward toward a common goal (Delgado-Romero et al., 2006). As Delgado-Romero and her colleagues (2006) stipulated in their study on Latina/o diaspora faculty, leadership must be clear from the on-set, prior to releasing a job posting, as to why a person of color is desired and the purpose that their identity may serve within the department. They distinguished between the need to hire a Latina/o faculty to simply "check the box," to mentor students of color, and/or to produce and provide opportunities for research on topics of diversity, with each of these areas serving a distinct purpose (Delgado-Romero et al., 2006). Therefore, through their qualitative study, Delgado-Romero and colleagues (2006) underscored the need for

leadership clarity prior to the start of the search process, in order to have the best opportunity for success in hiring a faculty member of color – and more importantly for the appropriate reasons.

While the role of leadership in the search process has been clearly stipulated by the previous studies, there remains a gap in understanding the social identities of the leaders in their studies and if those social identities had any impact on the ability to guide their colleagues and/or attract more underrepresented faculty. Opp and Smith (1994) did consider the impact of leadership's social identities on motivating change to diversification of the faculty and on attracting more underrepresented hires. In particular, they found that institutional leaders of color (i.e., board members, provosts, chief diversity officers, department leaders) had a positive impact on the hiring of faculty of color at two-year institutions, specifically. It was unclear whether the impact was derived from the leaders' positionality, their own social identities, or a combination thereof. This study in particular pointed to the importance of social identities of the leader as a tool in attracting more underrepresented faculty; however, as a qualitative study situated on a two-year campus, context does need to be deeply considered as hiring practices may vary between two- and four-year campuses, qualification required to teach at a two-year differ from that of a four-year, and mission statements of the campuses often also vary widely.

Overall, the studies discussed in this section pointed to the importance of the role of the department chair (or other administrator providing unit oversight) in motivating change in processes, and their role specifically within the search process.

Identified Strengths and Gaps Within the Literature

Most of the studies are qualitative, they provide a rich narrative regarding the challenges and potential approaches for creating change in the composition of the professoriate, but these

are all very context specific – either regionally, campus type, or disciplinary. They have pointed to key points in the recruitment and hiring process that are important to focus on when considering approaches to attract more women faculty and/or faculty of color to STEM. Conversely most of the quantitative studies truly focused on illuminating the gaps that persist in the professoriate, but did not student specific strategies to ameliorate the inequity. The study conducted by Smith and colleagues (2004) was the only exception to these quantitative studies, as they conducted an in-depth analysis of varying indicators that influence the possibility of hiring an underrepresented faculty member. They identified key indicators, and also called to action for future research to consider a qualitative component to provide a narrative to enhance the richness of the findings. Both qualitative and quantitative studies discussed in this literature review provide promising insights for this study; however, both types of analyses also leave a gap in presenting implications.

Research Question

Based on these gaps in the literature, and Smith and colleagues (2004) call to action, this study will focus on investigating this overarching research question: *What approaches do STEM departments take that are working to attract more women faculty and/or faculty of color than their disciplinary counterparts?* Furthermore, these sub-questions will guide the response to this main question:

1. Does the wording of job postings affect the composition of the applicant pool, and who is hired, in STEM departments?
2. What have STEM deans and/or department chairs of units that reflect positive deviant

tendencies done to motivate change in faculty recruitment and hiring practices?

This study purposefully seeks to understand *approaches* to these recruitment and hiring efforts as opposed to strategies in achieving these organizational goals. The field of strategic management has long studied decision-making strategies in various contexts and phenomena, thus leading to a common set of criterion for *strategy*. These criterion explicate that strategy must be treated as: "a) explicit, b) developed consciously and purposefully, and c) made in advance of the specific decisions to which it applies" (Mintzberg, 1978, p. 935). Thus stipulating the intentionality and pre-planning required for strategy to be accurately characterized[10]. Within research in organizational behavior, approaches have not been investigated under such stringent parameters, thus providing more flexibility in the structure and findings of studies. Since the intention of this study is to uncover a variety of strengths-based efforts in attracting more women faculty and/or faculty of color into STEM, leveraging approaches will provide the flexibility necessary to broaden the parameters in assessing the findings beyond criterion stipulated within the field of strategic management.

Conceptual Framework

With the organizational change literature being so broad and often so difficult to operationalize in non-temporal studies, taking a critical analysis through one of the processes potentially involved in organizational change, such as organizational routines. A deeper look into

[10] While this is the traditional conceptualization of strategy theory, within the field of strategy management contention exists regarding whether strategy must be structured (i.e., intended strategy), or if strategy can exist based on patterned choices or decisions (i.e., realized strategy) (Mintzberg, 1978).

organizational routines provides the opportunity to dive more deeply into the daily decisions, interactions, behaviors (Becker, Lazaric, Nelson & Winter, 2005), and ultimately processes involved in creating mobility toward positive deviance. Furthermore, hiring has been studied as one of the most traditional examples in understanding organizational routines (Nelson & Winter, 1982) and the mechanisms embedded that allow for organizational change to transpire. As such, "the phenomenon […of] 'hiring' clearly meets the basic definition of an organizational routine: it is a repetitive, recognizable pattern of interdependent actions carried out by multiple actors" (Feldman & Pentland, 2003, p. 105). Therefore, in order to better understand how organizational routines for faculty recruitment and hiring equity efforts are operationalizing in this study, I leverage the Competing Values Framework (CVF) as a tool to map the associated organizational behaviors.

Organizational Routines

Scholarship on organizational routines theory is broad and ambiguous as scholars have taken various approaches to defining and how identifying the impact of routines on organizations (Becker, 2004). However, the seminal definition of organizational routines is "a pattern of behavior that is followed repeatedly, but is subject to change if conditions change" (Winter, 1964, p. 263 as cited in Becker, 2004). Stemming from this definition, organizational routines have thus been conceptualized as both the foundational mechanisms reflective of organizational behavior, and archives of organizational competencies (Nelson & Winter, 1982). Following the evolution of research on organizational routines that developed from seminal scholars, including Nelson and Winter (1982), through a systematic review of the empirical literature, Becker (2004) deduced the basic characteristics of organizational routines. These 8 characteristics include:

patterns, recurrence, collective nature of routines, mindlessness vs. effortful accomplishment, processual nature of routines, context-dependence, path dependence, and triggers (p. 644-653).

In operationalizing these 8 characteristics, Becker (2004) explains that patterns are a necessary component of organizational routines. As such, routines are repeated *patterns* of behavior – inclusive of physical and cognitive behaviors. *Recurrence* is the most critical characteristic of routines, as repetition is an innately embedded assumption of routines. Therefore, an event or behavior that only happens once cannot be considered a routine. It is the knowledge that is developed and gained through the repetition of behaviors. *Collective nature of routines* refers to the multiplicity of actors required to actuate a routine. Thus, "routines are collective phenomena" (Becker, 2004, p. 646). In *mindlessness vs. effortful accomplishment*, the routine is characterized by the intuitive nature by which the behavior transpires. In other words, the more frequently a routine occurs, the less mindful actors need to be to actuate the behavior. Therefore the more mindfulness required for a behavior, the less routine-like it tends to be. *Processual nature of routines* points to the order in which the behaviors must transpire in order for a routine to form. While repetition, mindlessness, and the collective nature of routines are important, the order (i.e., process) of the repeated behaviors is an essential component of any given routine. *Context dependence* is a critical characteristic of routines to note as "context matters because it leads to routines that strongly differ in terms of power of replication, [and] degree of inertia" (Cohendet & Llerena, 2003, as cited in Becker, 2004). Similar to relevance of context, *path dependence* is important to the actualization of routines. As such, each step or stage of a routine is critically important on the prior one. Therefore, if one step or stage of a routine is adjusted or altered, the remainder of the routine cannot remain intact. The process for the routine must change by nature of its path dependence any time change is introduced. Finally, *triggers* are

significant to routines, as all routine processes must be triggered to begin, either by a person or exogenous force. Regardless of the source, a *trigger* is essential to a routine in signaling the implementation of the given routine. As Becker (2004) stipulates, all of these characteristics are significant in defining an organizational routine, as all components are equally important in uniquely defining how an organizational routine is operationalized.

Per Becker's (2004) analysis of organizational routines theory, the process defines the routine with moments within it where change can transpire. However, Feldman (2000, 2003) was the first scholar to introduce the concept of individual agency into organizational routines theory. In this research, she pointed to actors having a choice whether to follow established routines or to deviate. Through her work (2000, 2003), the role of individuals' impact on organizational routines began to be nuanced, in addition to the impact of these individuals' decisions on short and long-term change. As scholars have stipulated, individuals are the keepers of organizational knowledge, and routines are one way of exemplifying and solidifying such knowledge (Feldman & Pentland, 2003). This research underscores the individual agency that helped to explain how routines could be a foundation for organizational change *and* stability, concurrently (Feldman & Pentland, 2003).

Moreover, Feldman and Pentland (2003) argued that organizational routines are evidence of both stability and flexibility. Thus in their work, they stipulated that organizational routines carry *both* ostensive *and* performative aspects. Operationally, Feldman and Pentland (2003) define the ostensive aspects as those that represent the "principles" of organizational routine characteristics (i.e., the "generalized idea of a routine" (p. 101)), whereas the performative aspects of routines are those that strictly adhere to the specific behaviors by specific actors during specific times as dictated by the confines of organizational routines. For this study,

ostensive routines will be framed as approaches that in principle adhere to the concept of routines but leave room for innovation and creativity, and performative routines will be framed as approaches that adhere to the constraints defined by the practice and exhibited behaviors of hiring routines.

Overall Becker (2004) argued, studying organizational routines provides insights into the tacit knowledge that is stored, applied, decayed, and changed over time in the production of new outcomes within firms. Likewise, in this study, considering the faculty recruitment and hiring process within departments can provide a window into understanding the actions where routines are perpetuated, and where change can and has transpired by STEM departments and schools working to attract more women faculty and/or faculty of color. Organizational routines can be a mechanism for controlling an organization's behaviors, but as Feldman (2000, 2003) introduced, routines can exemplify where individual agency can affect change. With this tension between flexibility and control, Feldman and Pentland (2003) provided the framework for understanding that routines can be both ostensive and performative once operationalized.

Competing Values Framework

As discussed in the first part of this chapter, leadership values and decision-making processes are central to the success of recruiting and hiring underrepresented faculty (Delgado-Romero et al., 2007; Smith et al., 2004; Stewart et al., 2007). The Competing Values Framework (CVF) provides a "framework that can identify the factors that produce the most value in individuals and organizations" (Cameron, Quinn, DeGraff & Thakor, 2014, p. 4), thus offering a lens to consider approaches to faculty diversification. This framework acknowledges the daily organizational challenges and tensions in decision-making processes. While inequality in the

STEM professoriate persists, and may appear to be a collective issue, the context within which each unit (i.e., STEM department or school) functions is distinct. Thus, the diversity in context can create additional challenges if not acknowledged in the implementation of any change process.

The CVF allows for context and leadership value bases to dictate the type of decisions that are best fit for that organization. In other words, the CVF allow for *value* to vary, and be uniquely defined by the organization. After all, "what represents value for one organization may not represent value for another" (Cameron et al., 2014, p. 22). Even when the goal may appear similar – as in the case of STEM departments/schools working to diversify their faculty – the context in which they are functioning shift the orientation of *value*. This framework provides an organizational mechanism that "can identify the factors that produce the most value in individuals and organizations," and "can help leaders understand more deeply and act more effectively in creating value" (Cameron et al., 2014, p. 4).

The core dimensions of the CVF focus around the tensions that all organizations deal with in working toward efficacy and efficiency: flexibility *v.* control, and internal *v.* external focus. Since the CVF provides a roadmap for creating change, the framework also depicts the tensions along secondary dimensions as approaches to change including: speed of change and magnitude of change. As a framework developed in response to understanding the mechanisms for improving effectiveness, the CVF has been leveraged to assist hundreds of organizations in creating change, motivating constituents, and empowering leaders through organizational development and change (Cameron & Quinn, 2011; Cameron et al., 2014). These secondary dimensions will be further explicated below, as they are critical in understanding the types of approaches that organizations might take in approaching change.

In working toward making sense of complex phenomena such as diversity and equity, the CVF provides a guide to contending with the previously mentioned tensions (i.e., flexibility/control, internal/external focus, and speed/magnitude of change). In mapping these vertical tensions – flexibility *v.* control – and the horizontal tensions – internal focus *v.* external focus – the framework creates 4 quadrants that are arguably the most important feature of the CVF (Cameron & Quinn, 2011; Cameron et al., 2014). Figure 1 depicts the contending tensions as well as the 4 quadrants with identifying characteristics and behaviors of each quadrant. Since these quadrants and dimensions of change are such critical components in the application of the CVF, the following sub-sections will discuss in details each quadrant and the secondary dimensions of change.

Collaboration Quadrant: Upper Left Quadrant. The *collaborate* quadrant is marked by value-enhancing behaviors that focus on human development, collegial environments, and relationships (Cameron & Quinn, 2011; Cameron et al., 2014). The valued behaviors in this type of organization are associated with high levels of constituency engagement, and highly relational activities where the focus is on enhancing developing deeper relationships amongst the constituents and ensuring inclusivity of all constituents. Therefore, success in this quadrant is measured by the amount of human development that transpired during the change process, and the extent to which all pertinent constituents were highly engaged in the change process (Cameron & Quinn, 2011; Cameron et al., 2014).

The leaders in collaborative organizations aim to foster a "family-like" environment where a sense of "we-ness" permeates their shared values (Cameron & Quinn, 2011, p. 46). This

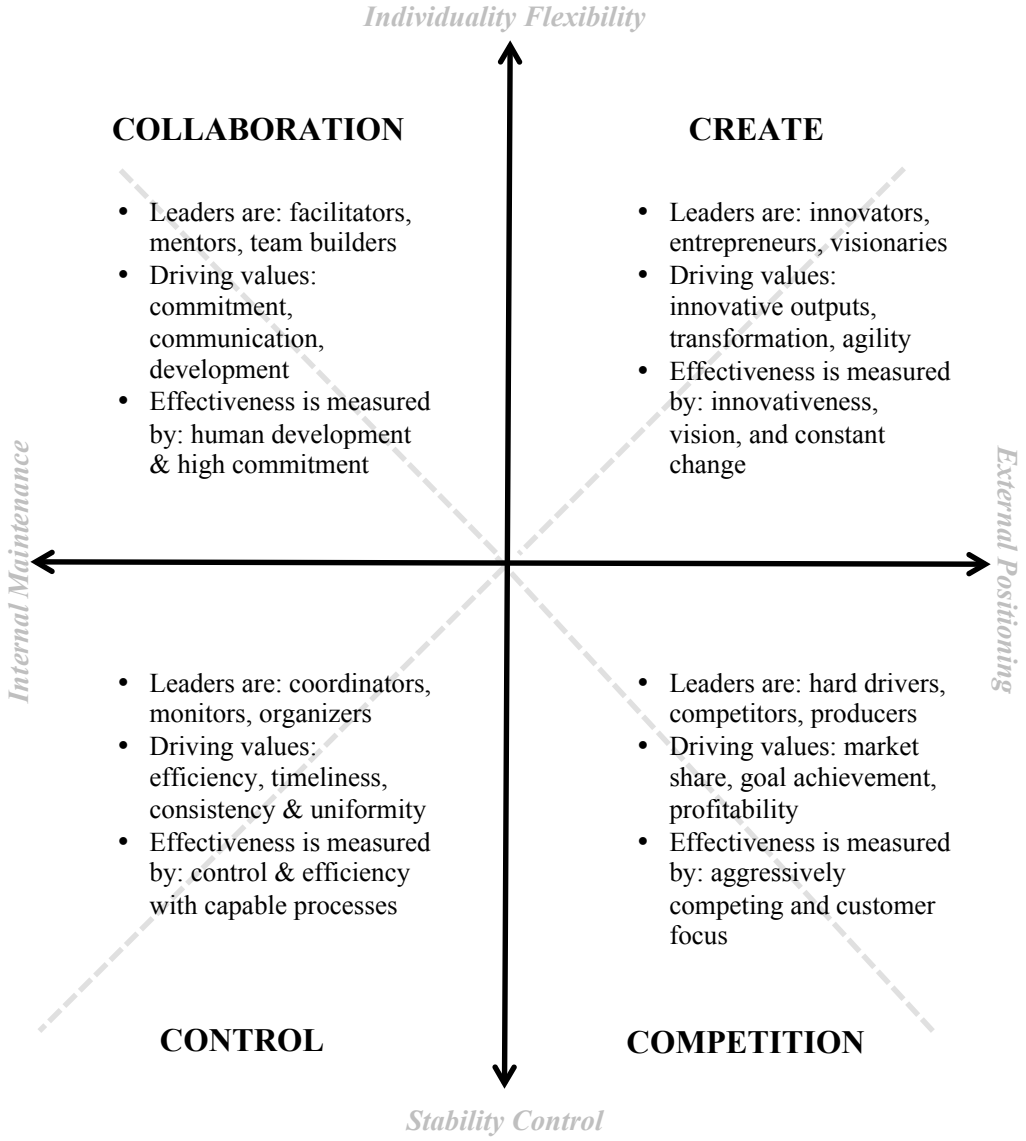


Figure 1. Competing Values Framework (Cameron et al., 2014)

type of leader tends to lead through teamwork and empowerment of constituents. In doing so, the leader works intentionally to develop a shared sense of values that help guide the organization through times of ambiguity and change. Therefore, in a collaborative organization, "success is defined in terms of internal climate and concern for people" (Cameron & Quinn, 2011, p. 48). Thus consensus building and developing buy-in are critical to the success of any change efforts.

In relation to the competing values, the *collaborate* quadrant is characterized by: leadership flexibility/adaptability, internal focus, and aiming for long-term change (Cameron & Quinn, 2011; Cameron et al., 2014).

Compete Quadrant: Lower Right Quadrant. The *compete* quadrant is characterized by opposing behaviors to the *collaborate* quadrant. Understandably, in meeting the organizational needs at the opposite end of the tension, compete focuses on intentional, often aggressive and forceful, attention on remaining competitive in the field (Cameron & Quinn, 2011; Cameron et al., 2014). As a framework that was developed to meet the needs of business organizations (Cameron & Quinn, 2011; Cameron et al., 2014), the field is measured as the marketplace; however, in higher education, the field can be defined as the department, school, university, or disciplinary field. In aiming to retain a competitive edge, these leaders and organizations value superior reputation in the field, quick responses in meeting needs, and are highly outcome driven (Cameron & Quinn, 2011; Cameron et al., 2014). The leadership style that is most effective in a competitive culture is a competitor themselves, and is a producer. In other words, they are highly focused on the product –the desired outcome that the organization has set out to achieve. In the case of this study, a successful outcome would be measured as the hire of a woman faculty and/or faculty of color. The leadership style in this quadrant is often characterized as directive and commanding. As is understood with such a culture, the pressure to produce is extremely high; however, the organization serves to develop exponentially as the pace of change is very quick (Cameron et al., 2014).

The overall organizational goal of units in this quadrant is to outpace their competitors. Therefore, as Cameron and Quinn (2011) explain, the focus of competitive leaders and organizations is on transactional activities and competing to remain at the "top." Success is

measured strictly by achievement of the outcome, and is less focused on the process or behaviors aligned with how change transpired. Thus, in this quadrant, value development is focused on: leadership control, externally focused (in comparison themselves to their outside competitors), and in a quick paced environment (Cameron & Quinn, 2011; Cameron et al., 2014).

Control Quadrant: Lower Left Quadrant. The *control* quadrant creates value around the development of clear processes and initiating processes that can enhance efficiency in current systems (Cameron & Quinn, 2011; Cameron et al., 2014). This quadrant is marked by high levels of intentionality associated with efficient processes, parameters, and a heavy sense of leadership regulation. The climate in a control organization tends toward stability, and slow-paced change (Cameron & Quinn, 2011; Cameron et al., 2014). The routines that are set in place mark the need for creating parameters to ensure an error-free outcome. In other words, the leaders in this quadrant intentionally create processes and routines that will regulate all processes involved in achieving the desired goal. In the case of this study, leaders would implement a strict, step-by-step procedures manual for faculty recruitment and hiring to work toward ensuring that the department/school will indeed hire a woman faculty and/or faculty of color. A successful leader in a control unit is highly organized, monitors closely (perhaps even micro-manages processes), and is a thoughtful coordinator (Cameron & Quinn, 2011; Cameron et al., 2014). Therefore, the leader is highly detail-oriented and/or has team members that support a highly detailed organization.

The *control* quadrant is typified by: rules, specialization, meritocracy, hierarchy, and accountability (Cameron & Quinn, 2011). In this quadrant, the process is highly valued in achieving the outcome. Leaders guide through structures that encourage consistency and uniformity in change process. Therefore, in this quadrant, value is developed by: internal focus,

leadership control, and aiming toward incremental changes (Cameron & Quinn, 2011; Cameron et al., 2014).

Create Quadrant: Upper Right Quadrant. The *create* quadrant is uniquely defined by innovation and creativity at the core of its values (Cameron & Quinn, 2011; Cameron et al., 2014). On the opposite side of the tension from the *control* quadrant, *create* firmly stands in a belief of "thoughtful rule breaking and stretching the boundaries beyond barriers" (Cameron et al., 2014, p. 36). The climate in these organizations tends to be hyper-turbulent and fast-paced that requires high levels of innovation and cutting-edge developments (Cameron & Quinn, 2011; Cameron et al., 2014). While instability may feel uncomfortable at times, especially on college campuses (where this study is situated), these high-risk, high-reward environments allow organizations to leap forward, and quickly achieve gains toward their desired outcome (Cameron et al., 2014). Thus such an environment demands a leader who is comfortable with, and confident in leading in, ambiguity. Furthermore, the leadership style needs to be highly communicative in disseminating a clear vision toward the goal (Cameron & Quinn, 2011; Cameron et al., 2014).

In the *create* quadrant, success is measured by the level of adaptation an organization possesses, and the amount of new resources that are developed through innovative strategies and approaches (Cameron & Quinn, 2011). While significant gains can be made in a relatively short period of time in this quadrant, the challenge is in the longevity of the change process. The solutions discovered in this quadrant are traditionally short-lived, specialized, and temporary (Cameron & Quinn, 2011). However, without approaches in the *create* quadrant, an organization could miss an opportunity for transformation. The most effective leaders in a *create* organization are innovators, entrepreneurs, and visionaries (Cameron & Quinn, 2011; Cameron et al., 2014).

Therefore, in this quadrant value is derived by: flexible leadership, an external focus, and aspiring toward transformational change.

Secondary Dimensions of Change: Speed and Magnitude. As discussed previously, since the CVF is a valuable tool in creating organizational change, it is important to understand the tension along the secondary dimensions of change that are exerted. As was noted through the discussion of each individual quadrant (and is illustrated in Figure 1), there are 2 diagonal tensions that drive leaders and organizations in decision-making processes: speed of change and magnitude of change. When considering the tensions between the *control* quadrant and the *create* quadrant, there is a tension present regarding speed of change. In one direction, the *control* quadrant pulls toward slow, incremental changes. This ensures stability within the organization and the least amount of disruption to established routines; however, the change is small, and very slow. Conversely, the *create* quadrant pull toward a quick-paced, transformative type of decision-making. This allows for rapid gains and transformative change to transpire quickly; however, it leaves the organization very unstable, and managing high levels of ambiguity (Cameron & Quinn, 2011; Cameron et al., 2014). Therefore, when considering the speed of change, the values that drive the organization and leadership decision can lead toward incremental, slow changes (in the *control* quadrant) or toward fast-paced, transformative changes (in the *create* quadrant).

On the opposite dimension of change, the tensions along magnitude (or depth) of change are managed. In the *collaborate* quadrant, the goal is toward long-term, long-lasting change; while in the *compete* quadrant, the goal focuses on fast, short-term change. The benefits achieved by working toward long-term change include: institutionalization of values, and less resistance and higher levels of engagement over time (Cameron & Quinn, 2011; Cameron et al., 2014).

However, long-term change is achieved at a much slower pace and therefore requires consistent investment to achieve the same levels of change as in the *compete* quadrant. In the *compete* quadrant, fast change is actuated, therefore higher gains are achieved much quicker (Cameron & Quinn, 2011; Cameron et al., 2014). The drawback is that these approaches can be short-lived and may never become institutionalized. Therefore, when considering the magnitude of change that can be achieved, leaders and organizations that are working toward quick changes will lean into the *compete* quadrant, while leaders and organizations working toward long-term, institutionalized change will invest in values within the *collaborate* quadrant. The context of the organization will dictate the most appropriate approaches and values that the leader and organization should engage in, as all approaches are appropriate but highly dependent on context (Cameron & Quinn, 2011; Cameron et al., 2014).

Understanding Organizational Routines Through the Competing Values Framework

In understanding that organizational routines can provide an insight into where STEM departments/schools might introduce change into their faculty recruitment and hiring practices, and that the CVF can provide a lens in understanding the varied approaches to change, an overlay of organizational routines with the CVF is proposed as a map to plot the various approaches taken by the STEM units while working to attract more women faculty and/or faculty of color in this study. These approaches will help identify important indicators influencing faculty diversification efforts.

Figure 2 illustrates this organizational routines' map of the CVF (adapted from Cameron et al., 2014) for the faculty recruitment and hiring process. Each quadrant includes identifying

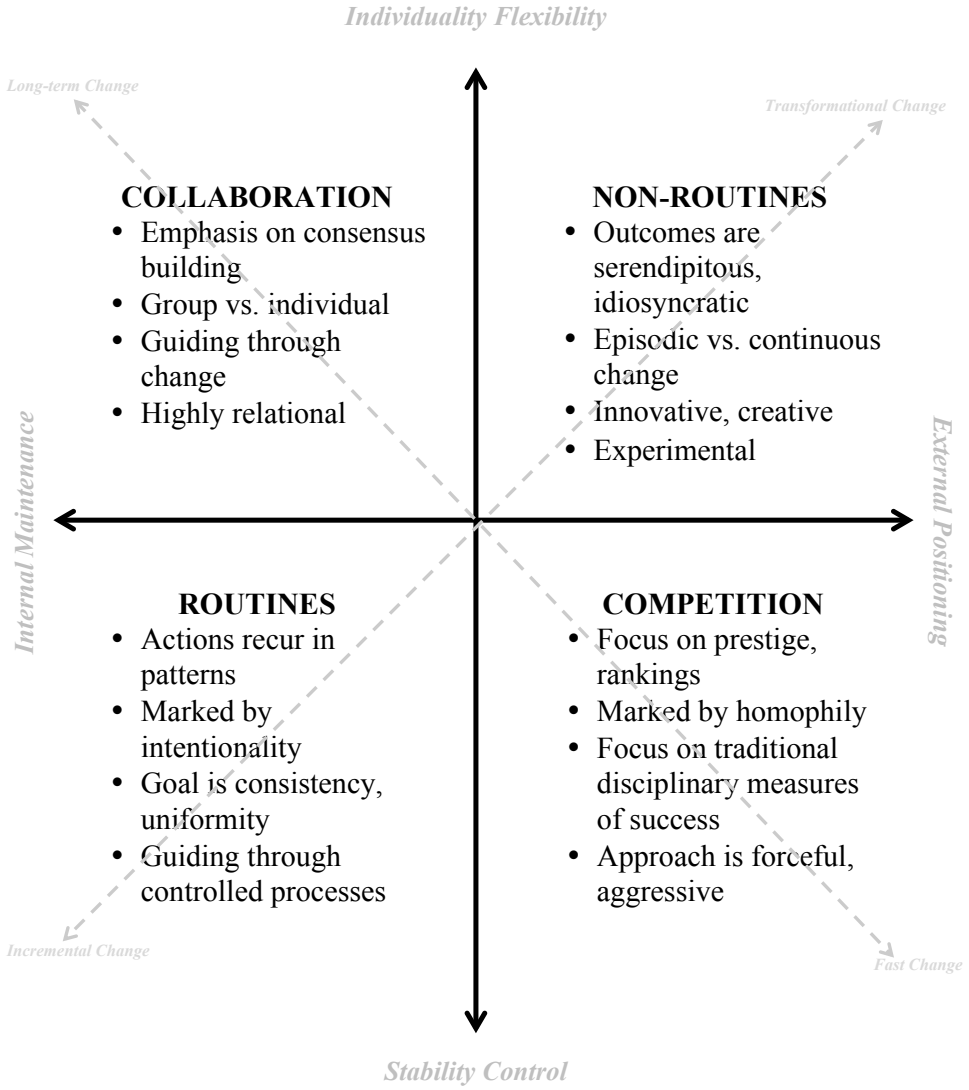


Figure 2. Competing Values Framework for the Faculty Recruitment and Hiring Process

characteristics that will allow for a systematic organization of the qualitative data to better understand the approaches STEM departments/schools are taking to recruit and hire more underrepresented faculty. This framework provides a lens to capture both structured and traditional approaches to the recruitment and hiring process, in addition to creative and serendipitous opportunities. The *routines* and *non-routines* quadrants represent the tension in

routines that occurs during the recruitment and hiring process (i.e., committee formation, job posting, interviewing, making an offer), while also recognizing that change might arise from sporadic, idiosyncratic incidences. As Feldman and Pentland (2003) discussed, the routines quadrant carries many of the performative aspects of organizational routines (i.e., structured, planned, intentional), while the non-routines quadrants aligns with the ostensive aspects of organizational routines (i.e., creative, innovative, idealistic). Likewise, the *collaboration* and *competition* quadrants explicate the tension between how the process transpires, whether it is more collective in nature (i.e., through a communal process) or more of a competitive process that is streamlined to disciplinary values (i.e., number of publications, acquisition of funding, prestige in the discipline of the candidate). This CVF map provides a framework to plot each interview emphasis, as it relates to leadership approaches in motivating change toward faculty diversification. Each interview emphasis will be individually plotted on this reconceptualized CVF to help identify the effective strategies (and the quadrants in which the strategies lie) to attract more women faculty and/or faculty of color into STEM departments/schools.

Summary

In summation, Chapter II began with a contextualization of the current status of women faculty and faculty of color in STEM. This created the backdrop to better understand the recruitment and hiring process as one access point to the professoriate. Thus the second major section of this chapter discussed in-depth the literature as it related to the search process, highlighting 3 primary areas around the hiring of underrepresented faculty: barriers impacting the recruitment and hiring of underrepresented faculty, the recruitment and hiring process (itself), and the role of leadership in creating change in the recruitment and hiring process. A critical

review of this literature illuminated to several strengths and gaps that directly to the research question guiding this study.

The second half of this chapter focused on the conceptual framework that will be leveraged for the analysis of the findings in this study. The framework is an overlay of organizational routines on the Competing Values Framework – as the window of opportunity where change can best be measured and operationalized in the search process. This framework will be used to plot interview emphases throughout the qualitative strand (introduced in the following chapter, Chapter III) in helping identify effective recruitment and hiring strategies implemented by departments/schools that have a tendency toward positive deviance toward attracting more women faculty and/or faculty of color.

Chapter III: Methodology

Research Study Design

For this study, the choice of methodology connects directly with my research question: *What approaches do STEM departments take that are working to attract more women faculty and/or faculty of color than their disciplinary counterparts?* In studying the phenomenon of faculty recruitment and hiring practices, the sub-questions guiding the inquiry – *1. Does the wording of job postings affect the composition of the applicant pool, and who is hired, in STEM departments; and 2. What have STEM deans and/or department chairs of units that reflect positive deviant tendencies done to motivate change in faculty recruitment and hiring practices?* – draw directly from the extant literature on recruitment and hiring practices for women faculty and faculty of color point discussed in Chapter II. These questions point directly to a mixed methodology research design. Neither a qualitative or quantitative approach independently will suffice to adequately address the research question (guided by the sub-questions) at the core of this study. Thus a mixed methods design is the most appropriate design to investigate this phenomenon. This chapter will discuss the specific characteristics of mixed methods research design, convergent parallel design (which is the particular design implemented in this study), methodologies and analyses at each suggested stage, data management, potential limitations, and positionality of the researcher.

Step 1: Mixed Methods Research Design

With an emerging interest in research topics that were both inductive (qualitative) and deductive (quantitative) in nature (Creamer & Ghoston, 2012), mixed methods as a research design grew in popularity within the social sciences. As the newest research design, mixed methods has undergone considerable shifts in conceptualization as its gained legitimacy within the disciplines (Creswell & Plano Clark, 2011). The shifts have primarily centered about the foci of the design, from methods and philosophy in the late 1980s (Greene, Caracelli, & Graham, 1989) to methods and purpose in the early 2000s (Johnson, Onwuegbuzie, & Turner, 2007) to its current focus on a combination of methods philosophy, and research design (Creswell & Plano Clark, 2011). As expected, with the changes in conceptualization, the definition of mixed methods has also adapted accordingly. Currently, the most encompassing and fitting definition of mixed methods is:

> Mixed methods research is a research design with philosophical assumptions as well as methods of inquiry. As a methodology, it involves philosophical assumptions that guide the direction of collection and analysis and the mixture of qualitative and quantitative approaches in many phases of the research process. As a method, it focuses on collecting, analyzing, and mixing both quantitative and qualitative data in a single study or series of studies. Its central premise is that the use of quantitative and qualitative approaches, in combination, provide a better understanding of research problems than either approach alone (Creswell & Plano Clark, 2007, p. 5, as cited in Creswell & Plano Clark, 2011).

My use of a mixed method approach is meant to draw on the strengths of both qualitative and quantitative methodologies to better understand the phenomenon at hand, in ways that each

method individually could not adequately do so (Creamer & Ghoston, 2012; Creswell, 2003; Creswell & Plano Clark, 2011; Griffin & Museus, 2011).

With a more robust design, mixed methods provides the rich context, situation, personal narrative, and the voice of participants that is often lacking in quantitative methods (Creswell, 2013; Griffin & Museus, 2011; Merriam, 2009), while also quantitative designs provide the a higher promise for generalizability of findings in a way that is a limitation of qualitative methods (Creswell, 2013; Creswell & Plano Clark, 2011; Griffin & Museus, 2011). It is intended for the two data sets to complement each other in understanding a single question or phenomenon in a way that "provide(s) a richer source of information than either one could by itself" (Maruyama & Ryan, 2014, p. 445). Furthermore, this design enhances the accessibility to more tools during data collection, as opposed to remaining restricted to the prescribed ones within qualitative or quantitative methods (Creswell & Plano Clark, 2011). With these broadened design opportunities, it allows scholars to investigate questions that otherwise would not be answerable with one approach alone. Similarly, mixed methods "encourages the use of multiple worldviews, or paradigms (i.e., beliefs and values)…[and] it encourages us to think about a paradigm that might encompass all of quantitative and qualitative research, such as pragmatism" (Creswell & Plano Clark, 2011, p. 13). As Creswell and Plano Clark (2011) point to, mixed methods research design has several practical strengths in that it frees the scholar from some limitations posed by qualitative and quantitative methods, but it also has strengths in addressing practice-based questions in the social sciences.

In considering a phenomenon such as faculty recruitment and hiring practices, one with a long history of challenges and unsuccessful attempts as discussed in Chapter II, mixed methods

research design is the approach that best fits the research question. It is more evident that mixed methods is the ideal design when examining the sub-questions proposed:

1. *(Quantitative Methods)* Does the wording of job postings affect the composition of the applicant pool, and who is hired, in STEM departments?
2. *(Qualitative Methods)* What have STEM deans and/or department chairs of units that reflect positive deviant tendencies done to motivate change in faculty recruitment and hiring practices?

Although mixed methods is a straightforward choice for my study, there are several types of mixed methods designs that guide the processes of data collection, analysis, interpretation, and reporting of the results. According to Creswell and Plano Clark (2011), while narrowing the variations of mixed methods designs down is challenging, they recommend a six-design typology as a guide for researchers. These designs vary based on several dimensions, including: level of mixing (of methods), emphasis of approaches, and time orientation. Griffin and Museus (2011) also argue that the purpose of mixing is an important dimension to consider purpose of mixing.

Convergent Parallel Design

A convergent parallel design (also referred to as convergent design and partially mixed concurrent equal status design) is the most commonly implemented mixed method design of the prototypes (Creswell & Plano Clark, 2011; Leech & Onwuegbuzie, 2009). In its simplest form, this design is described as:

> The convergent parallel design (also referred to as the convergent design) occurs when the researchers uses concurrent timing to implement quantitative and qualitative strands during the same phase of the research process, prioritizes the methods equally, and keeps

the strands independent during analysis and then mixes the results during the overall interpretation (Creswell & Plano Clark, 2011, P. 70-71).

Figure 3 provides a depiction of the general process for a study utilizing a convergent parallel design.

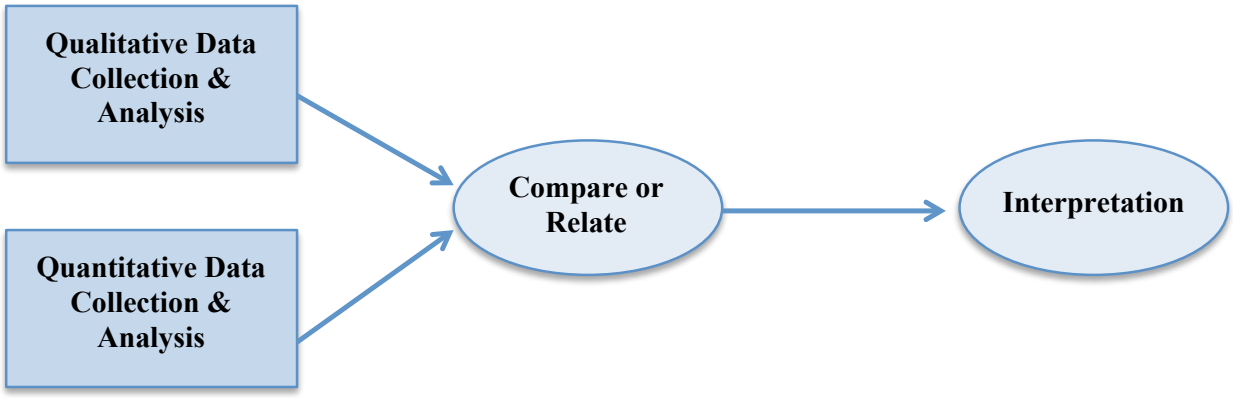


Figure 3. Prototypical Version of the Convergent Parallel Mixed Method Research Design (Creswell & Plano Clark, 2011, p. 69)

As is illustrated, the data collection and analysis for both the qualitative and quantitative strands take place concurrently yet independently from each other. The *mixing*, of the mixed methods, does not occur until the analysis for both strands is complete. At this stage the findings are then compared and contrasted for an overall interpretation of the studies' findings on the subject at hand. Distinct from other mixed methods studies that are fully mixed, and during multiple stages of the study (Creswell & Plano Clark, 2011; Leech & Onwuegbuzie, 2009), convergent parallel is thus referred to as partially mixed because the merging does not take place until analyses are in-hand.

One of a convergent parallel design's primary purposes is to aid in providing a more comprehensive understanding of the phenomenon by allowing the use of one method to expand or corroborate the findings of the other (Creswell & Plano Clark, 2011; Griffin & Museus, 2011). Critical to this design is the fact that both strands, qualitative and quantitative, carry equal weight in providing insights on answering the research question. In other mixed methods studies, one strand is more important in shedding light on the research question, therefore creating a heavier emphasis on the data collection and analysis of that given strand (Creswell & Plano Clark, 2011; Leech & Onwuegbuzie, 2009; Maruyama & Ryan, 2014).

My study is emblematic of a convergent parallel design. Figure 4 illustrates the specificities of each strand – through the strand's identified goal, procedure, and analysis – during the early stages of the study, and exemplifies the stage at which the mixing takes place. Figure 4 is an adaptation based on Creswell and Plano Clark's (2011) general design, as projected to study STEM departments that attract more women faculty and faculty of color.

As was indicated earlier, in order to investigate the first sub-question regarding actions that department chair and/or school deans utilize to create change in the recruitment and hiring process, qualitative methods is the most appropriate approach. More specifically, a comparative case study will provide the richness of data to better understand the themes that may arise from each case study. Conversely, in order to understand the impact of a specific recruitment and hiring strategy underscored in the literature – language in job postings (Knowles & Harleston, 1997; Smith, 2000; Smith et al., 2004; Stewart & Valian, in press; Turner, 2002) – quantitative methods is more appropriate. In this case, since I am testing whether the job posting has an influence on the development of a more diverse applicant pool, a Zero Inflated Negative Binomial regression analysis is the most appropriate analytic method due to the skewedness in

the data. However, when analyzing the influence of the job posting working on the potential for a woman and/or person of color to be hired, a binary logistic regression is the best analytic method. The following sections will discuss in detail the sampling strategies and data collection within each strand, and subsequently the methodology and analysis within each strand.

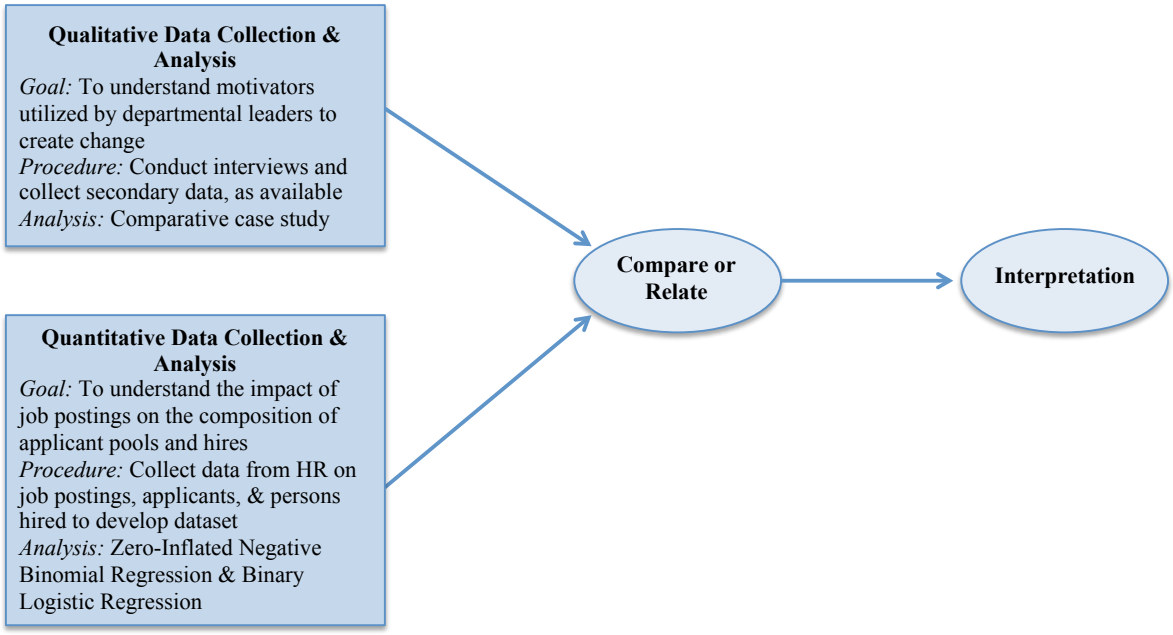


Figure 4. Convergent Parallel Mixed Method Research Design for Examining STEM Women Faculty and Faculty of Color Recruitment and Hiring Practices (Adapted from: Creswell & Plano Clark, 2011, p. 69)

Sampling and Data Collection

In mixed methods studies, especially in the cases of convergent parallel design studies, selection of case sites and data sampling become central for reliability of the overall results.

Qualitative Strand: Case Sampling

A case (i.e., the data collection location necessary for a comparative case study analysis) is selected for its "typicality, uniqueness, [or] success" (Merriam, 2009, p. 41), and customarily examines "how" or "why" questions (Yin, 2014). Thus, 5 units (i.e., departments or schools)

were identified at Midwestern University (see Chapter V for a detailed context of this campus) for their leadership and involvement campus-wide on faculty diversification efforts, most markedly on campus-wide committees. The Provost's Office with oversight over diversity, equity, and inclusion efforts has assisted in identifying the top 5 units with these criteria. Their participation on these committees and devotion to these diversification efforts are indicators of their positively deviant behavior. The uniqueness of each unit (as discussed further in Chapters VI through X) make them ideal for a case study analysis, and subsequently a comparative case analysis (Merriam, 2009).

Within-case sampling and data collection. I selected participant interviews to develop a comprehensive understanding of the phenomenon of interest (e.g., faculty recruiting and hiring practices) and the social context of the case (e.g., STEM units that are exhibiting positively deviant behavior toward faculty diversification efforts) (Stake, 2005; Yin, 2014). The 5 case sites selected were: astronomical sciences, chemistry, environmental sciences, information and library sciences, and physics. I conducted a total of 22 interviews (see Table XX in Chapter V under the Participant Profile), evenly split by gender and leadership/faculty rank. The interviews were each 30-60 minutes in length, conducted in a location of the participant's choice that provided privacy for anonymity that was requested. All interviews (except for 1[11]) were conducted in-person. Each semi-structured interview (except for 1[12]) was recorded, and later transcribed verbatim, for use as primary sources of data for this qualitative strand. The data from these interviews were collected between April and June 2018, with the exception of the data from the chemistry department.

[11] Due to scheduling conflicts, I conducted one interview (Jeff's) by phone.
[12] Valeria requested that the interview not be recorded, thus did not sign the IRB consent providing me with permission to do so. Thus I took copious notes of our conversation and developed a memorandum shortly following our meeting, capturing the details of our conversation.

These data were drawn from previously collected data (of a larger study on diverse STEM PhD programs) over a 17-month period (from November 2014 through June 2015).

The participants for this study were selected via convenience sampling (Merriam, 2009). The contact in the Provost's Office helped identify key diversity leads within the identified units, based on their committee involvement. I subsequently invited these diversity representatives to have a conversation (which often times led to the interview) to discuss my study, and to help me identify other faculty and departmental or school-wide leaders that are invested in faculty diversification efforts. Of the 5 departments/schools that I contacted, I had an 88% response rate of faculty and leaders willing to be interviewed. Reflective memos were also produced throughout the data collection process to enhance the richness of the data collected.

Quantitative Strand: Job Postings Data (N=724)

With Midwestern University as the site selected for the qualitative strand, quantitative data collection on this campuses enhanced the combined findings of this study in understanding what STEM chairs and deans have done to work toward attracting more women faculty and/or faculty of color.

Hypotheses. This study broadly looks to investigate the approaches that STEM departments take to attract more women faculty and/or faculty of color than their disciplinary counterparts. This quantitative strand explores the impact of one recruitment strategy – the job posting – on the development of a more diverse applicant pool. The indicators tested for significance were: 1) scholarly focus (as indicated in the job posting as broad or narrow), 2) presence of diversity statements (including individual ones recommended by CEDE), and 3) support structures available (measured by the mentoring structures alluded to in the posting). As underscored by the higher education literature, institutions are more likely to recruit and retain

underrepresented faculty in STEM if they are intentional and unapologetic regarding their rationale for a diverse hire (Bensimon, 2005, 2010; Delgado-Romero et al., 2007). Therefore, this quantitative strand aims to test the first three hypotheses, via an OLS Regression Analysis:

H_1: STEM departments that issue broad job postings, with regard to scholarly specialization, are more likely to attract a larger proportion of underrepresented applicants to their positions.

H_2: STEM departments that include prominent diversity statements in their job postings are more likely to attract a larger proportion of underrepresented applicants to their positions.

H_3: STEM departments that signal the presence of support structures are more likely to attract a larger proportion of underrepresented applicants to their positions.

Furthermore the quantitative strand also intends to test the following three hypotheses, via Binary Logistic Regression Analysis:

H_4: STEM departments that issue broad job postings, with regard to scholarly specialization, are more likely to hire a woman or faculty of color for the position.

H_5: STEM departments that include prominent diversity statements in their job postings are more likely to hire a woman or faculty of color for the position.
H_6: STEM departments that signal the presence of support structures are more likely to hire a woman or faculty of color for the position

Job posting data. The data for this study are drawn from publicly available job postings on the Midwestern University Human Resources site. These data are retrieved, in collaboration with each campus' Office of Human Resources, from their data archives. Specifically, these data represent all tenure track faculty postings from July 2006 through July 2016, for their main campus locations only[13]. In order to understand the impact of the job posting on faculty recruitment and hiring, I purposefully excluded postings for: adjunct, lecturer, clinical, and other faculty positions, as these may not be as competitive or face the same challenges as tenure track positions traditionally do.

The data for Midwestern University were collected as part of a larger project through the DTG program on campus[14], which aimed to help the campus understand whether job posting language (i.e., broad versus narrow specializations) have an impact on faculty hiring. Following several rounds of data gathering from Human Resources, we acquired all of the variables necessary to create the database desired. The database contains a robust set of entries (N=724) with data, including both STEM and non-STEM tenure track faculty postings.

Outcome Variables. For the quantitative strand, the unit of analysis is at the institution level (specifically at Midwestern University). The outcome variable for the first 3 hypotheses of this strand is the applicant pool. Conversely the outcome variable for the last 3 hypotheses analyses is the person hired. The alignment between the 2 sets of hypotheses lies in the assumption that the larger and more diverse an applicant pool is, the higher the possibility of

[13] This is particularly important to narrow, especially for Midwestern University's main campus only, and does not include data from the Medical School as their hiring parameters are distinct from other disciplinary generally posted faculty positions.

[14] I was hired as a research associate through DTG, and was assigned as the lead in developing this specific database for the program. I have been granted permission to use these data for the purposes of my study.

hiring a woman and/or person of color for the position (Stewart et al., 2007).

The applicant pool (dependent variable) is measured as proportion. While the person hired (dependent variable) is measured dichotomously (based on whether the person hired is a women and/or people of color (yes=1)). While some may question the confidentiality of these data, none of the data requested from the human resources offices should be considered confidential, as all of the job postings were once publically available. The applicant and hire data are not tied to any personal identifiers.

Explanatory Variables. Since a woman and/or person of color applicant and hire are the intended outcomes for STEM units working to diversify their faculty, the independent variables are designed to measure three factors within the job postings that are hypothesized to have a favorable impact on the outcome (see p. 57 for hypotheses). *Scope of research specialization* and *signals of support structures* are individually comprised of single variables and will independently be analyzed against each of the outcome variables, while *presence of diversity statements* is derived from several indicator variables to be tested separately against the outcomes. Further explanation follows.

Scope of research specialization. The scope of research specialization aligns directly with the literature documenting the larger pools of applicants for positions and the higher possibility of hiring a woman and/or person of color when the job posting uses *broad* versus *narrow* language (Knowles & Harleston, 1997; Smith, 2000; Stewart & Valian, in press). Appendix B provides several examples of broad job postings compared to narrow job postings. As such, the primary distinction is in the specificity of academic expertise that a department states in its job posting. The more specific or narrow a job posting is perceived, the less likely a historically underrepresented individual is to apply to that given position (Stewart et al., 2007). Therefore,

this quantitative strand examines the impact of the scope of research specialization on the probability of a woman and/or person of color to apply and/or be hired. The data for this dichotomous variable (broad=1) are drawn from the job postings for tenure track faculty at Midwestern University from 2006 to 2016, which is coded through a content analysis process for scope.

Presence of diversity statements. The literatures on diversity within higher education calls for bold leadership and a clarity of goals (Bensimon, 2005, 2010). As such it calls for a deep intentionality of efforts in order to create change in a system that has long been fraught with issues of inequality. Under this perspective, a group of variables highlighting the presence of diversity statements are assessed in relation to the outcomes. For this quantitative strand, the influence of each individual statement (see Appendix B, Diversity Statements in Job Postings) was tested as related to the development of a more diverse applicant pool. Subsequently, the presence of any diversity statement was analyzed in relation to the potential of a woman and/or person of color hire. The variable is broadened to include the presence of any statement as an indicator of a diversity hire, as a marker of the department/school's willingness to be open to considering diversity as an important aspect of hiring.

Signals of support structures. As indicated in Chapter II, successful recruitment and hiring does not end once a candidate is formally hired. As Turner (2002) urges search committees and campuses to recall, supporting a diverse hire once they are on the tenure track to be successful is key in this entire process. Furthermore, various studies that emphasize the impact of negative climates on faculty of color and women faculty (in departments where they are underrepresented) experience on a daily basis (Greene & Stockard, 2010; Griffin, Bennett & Harris, 2011; Griffin, Pifer, Humphrey & Hazelwood, 2011; Reyes & Halcon; Stanley, 2006)

highlight the challenges that are present for these faculty, and the need for support networks and formalized mentoring structures to be present. Cluster hires can be seen as an informal support structure that the faculty hire will come in with, at least on an academic level. Thus, this dichotomous variable (cluster=1) is a proxy for institutional signals of support structures that are present. Cluster hires can be advertised in various ways (e.g., as a cluster hire across disciplines on interdisciplinary work, as a cluster hire within a given department around a scholarly area, more than one hire in a department without specific clustering strategies). These clusters simply signal to a prospective applicant that they could be hired in with another person or a group of others, thus forming a network upon entering. The data for this variable are drawn from the language in the job postings from the two campuses.

Control Variables. The institutional level control variables for this quantitative strand are: STEM discipline status (dichotomously measured as STEM=1, non-STEM=0), and posting status (categorically measured as repost=2, extension=1, single post=0), year of posting (measured by academic cycle), job title (measured by the Human Resources identifier relative to the respective faculty title). See Appendix C for a list of STEM disciplines, as designated by the National Center for Education Statistics. As for posting status, some positions are noted as open for a longer than average timespan. Therefore, a coding system was devised to consider whether a single post (on average several weeks), an extended post (a posting that remains open for an additional period of time but does *not* have a break in posting for more than 7 days), or a report (a posting that remains open for an additional period of time but experiences a break in posting for more than 7 days) has an impact on the applicant pool. At this time, since the literature does not point to this as a possible indicator of a diverse hire, it will remain a control variable in this study. Collectively these control variables provide an institutional framework from which to

compare the variables of interest to the outcomes.

Step 2: Methodology and Analysis

As explained, for convergent parallel design mixed methods studies, the qualitative strand and quantitative strand function independently and concurrently in the first stages of the study (Creswell & Plano Clark, 2011). This section will explain the methodology and analysis for each strand in further detail.

Qualitative Strand: Comparative Case Study Methodology and Analysis

As previously discussed, in an effort to better understand the motivators that STEM department chairs and/or deans utilize to create change in their faculty recruitment and hiring practices, case study methodology (more specifically comparative case study methodology) provides the best insight into this phenomenon. The strength of case study research is in providing "in-depth description and analysis of a bounded system," such as an organization (Creswell, 2013; Merriam, 2009, p. 40; Stake, 2005). For this study, the rich, context-specific data drawn from case studies makes them ideal for studying complex pragmatic practices – in this case, approaches taken by STEM departments that attract more women faculty and faculty of color. While this may sound simplistic, the slow pace at which STEM departments have diversified their faculty over time is evidence that these practices remain socially complex. As detailed earlier in this chapter, 5 departments at Midwestern University were identified as cases due to tendency toward positive deviance in recruiting and hiring more women faculty than their disciplinary counterparts.

Critical to note, distinct from case study methodology, comparative case study methodology requires the ability to develop codes and themes over multiple cases (Merriam, 2009). Comparative case study analysis, or cross-case comparison as it is also referred to as, is

more an analysis technique instead of a research design (Yin, 2004), that requires a two-stage process in order to first conduct a "within-case analysis" then a "cross-case analysis" (Merriam, 2009, p. 2004) that will be detailed in the following section. These within-case and cross-case findings will be merged with the findings from the quantitative strand in the next stage of the study.

Quantitative Strand: Ordinary Least Squares and Binary Logistic Regression Analyses

This section introduces the types of analyses that will be conducted in order to better understand the indicators that may be contributing to the development of a more diverse applicant pool, through Ordinary Least Squares (OLS) Regression analyses. Similarly, in an effort to identify any indicators associated with the job posting that may influence the potential for a woman and/or person of color to be hired into the open position, Binary Logistic Regression Analyses will be conducted. Furthermore, an explanation regarding rationale for analyses, models tested, and best model-fit analyses are also included in this section.

Ordinary Least Squares Regression Analyses. For the first set of hypotheses (1-3), the dependent variable – the applicant pool – will be measured as a proportion of underrepresented applicants (i.e., women, applicants of color in STEM) to majority (population) applicants (i.e., White, Asian/Asian American, men in STEM). For these analyses, I will be testing the influence of the job posting language (as designated by the indicator variables) on the development of a more diverse applicant pool. As such, each of the independent variables discussed earlier in this chapter will be tested: *scope of research specificity, presence of any diversity statements,* and *signals of support*. An unrestricted model considering all indicator variables collectively in predicting a department's propensity to create a diverse applicant pool will also be tested. Since

the outcome variable will be measured as a proportion, the best method of analyses in testing the hypotheses will be Ordinary Least Squares (OLS) regression (Long & Freese, 2006).

$$\widehat{ApplicantPool}_i = \alpha + \beta_1 Scope_i + \beta_2 PostingStatus_i + \beta_3 STEM_i + \beta_4 Year_i + \beta_5 JobTitle_i \beta_6 Department_i \quad (1)$$

$$\widehat{ApplicantPool}_i = \alpha + \beta_1 DivStatePresence_i + \beta_2 PostingStatus_i + \beta_3 STEM_i + \beta_4 Year_i + \beta_5 JobTitle_i \beta_6 Department_i \quad (2)$$

$$\widehat{ApplicantPool}_i = \alpha + \beta_1 SignalsSupport_i + \beta_2 PostingStatus_i + \beta_3 STEM_i + \beta_4 Year_i + \beta_5 JobTitle_i \beta_6 Department_i \quad (3)$$

$$\widehat{ApplicantPool}_i = = \beta_0 + \beta_1 Scope_i + \beta_2 DivStatePresence_i + \beta_3 SignalsSupport_i + \beta_4 Campus_i + \beta_5 STEM_i + \beta_6 Posting_i \quad (4)$$

In exploring several models with the intention of identifying significant indicators influencing the development of a diverse applicant pool, and who is hired, several model-fit tests will be executed to confirm the best-fit model for the data presented in forthcoming chapters. A Hosmer-Lemeshow test of fitness will be explored. And for statistical evidence, a *fitstat* test (on Stata) will be executed. All of these goodness-of-fit tests will be performed for Model 1 (as the restricted model) in comparison to Model 4 (as the unrestricted model) (Long, 1997). Results will be presented in Chapter IV.

Binary Logistic Regression Analyses. Binary logistic regression is the primary method of analysis explored in Hypotheses 4-6 aimed at understanding the predictor variables of influence on a potential woman and/or person of color hire in a STEM department/school. More specifically, binary logistic regression analysis is utilized to test the impact of the wording of job postings on the person hired, in STEM departments. However, with multiple hypotheses explored, several models are estimated.

Each explanatory variable under investigation is analyzed individually in restricted

models[15] for impact on the outcome variables (Models 5-8 for diverse faculty hire). Model 5 investigates the impact of the scope of research specificity on the diverse hire. Model 6 investigates the impact of the three *presence of diversity statement* variables, while Model 7 examines the influence of signals of support structures on the probability of a diverse hire. The unrestricted model considered all explanatory variables collectively in predicting a department's propensity to hire a woman and/or person of color (see Model 8).

$$ln\ [Pr(DFH)|Pr(1\text{-}DFH)]_i = \beta_0\ \beta_1 Scope_i + \beta_2 PostingStatus_i + \beta_3 STEM_i + \beta_4 Year_i + \beta_5 JobTitle_i\ \beta_6 Department_i + e \quad (5)$$

$$ln\ [Pr(DFH)|Pr(1\text{-}DFH)]_i = \beta_0 + \beta_1 DivStatePresence_i + \beta_2 PostingStatus_i + \beta_3 STEM_i + \beta_4 Year_i + \beta_5 JobTitle_i\ \beta_6 Department_i + e \quad (6)$$

$$ln\ [Pr(DFH)|Pr(1\text{-}DFH)]_i = \beta_0 + \beta_1 SignalsSupport_i + \beta_2 PostingStatus_i + \beta_3 STEM_i + \beta_4 Year_i + \beta_5 JobTitle_i\ \beta_6 Department_i + e \quad (7)$$

$$ln\ [Pr(DFH)|Pr(1\text{-}DFH)]_i = \beta_0 + + \beta_1 Scope_i + \beta_2 DivStatePresence_i + \beta_3 SignalsSupport_i + \beta_4 Campus_i + \beta_5 STEM_i + \beta_6 Posting_i + e \quad (8)$$

In order to ensure best-fit model for the Binary Logistic Regression analyses, model-fit tests will also be executed for the data presented in future chapters. Graphical representations will be examined through observation of the *LROC* and *LSENS* curves. A Hosmer-Lemeshow test of fitness will be explored. And for statistical evidence, a *fitstat* test (on Stata) will be executed. These goodness-of-fit tests will be executed for Model 5 (as the restricted model) and Model 8 (as the unrestricted model) (Long, 1997). Results will be presented in Chapter IV.

[15] This quantitative strand investigates the impact of the explanatory variables on the presence of a woman and/or applicant of color, independent of each other, while controlling for STEM discipline status, year, job title, and posting status. Unless otherwise stated, all analyses are conducted under these premises at the 95 percent confidence level.

Step 3 and Beyond: *Mixing* the Results of the Study

In alignment with convergent parallel research design, step three is when the *mixing* of the mixed methods begins. At this stage of the study, both strands of the data will be analyzed and ready to be combine for comparative analysis. Through this comparative analysis I am able to identify themes of similarities and variations in the findings. This stage of the study poses some of the largest challenges as carefully managing the combination of the results is often a barrier (Creswell & Plano Clark, 2001). In this stage of the study analyses, I pull from the higher education literature on diversity and faculty hiring processes, along with the conceptual framework at the center of the qualitative analysis (the Competing Values Framework as conceptualized through organizational routines theory). In doing so, I return to the overarching research questions for this study: *What approaches do STEM departments take that attract more women faculty and/or faculty of color than their disciplinary counterparts?*

Through the combination of the findings and the strengths in approaches, the implications of this study will be much more generalizable and practical in impact to the field of higher education. Figure 5 depicts a flowchart of the implementation steps in this study.

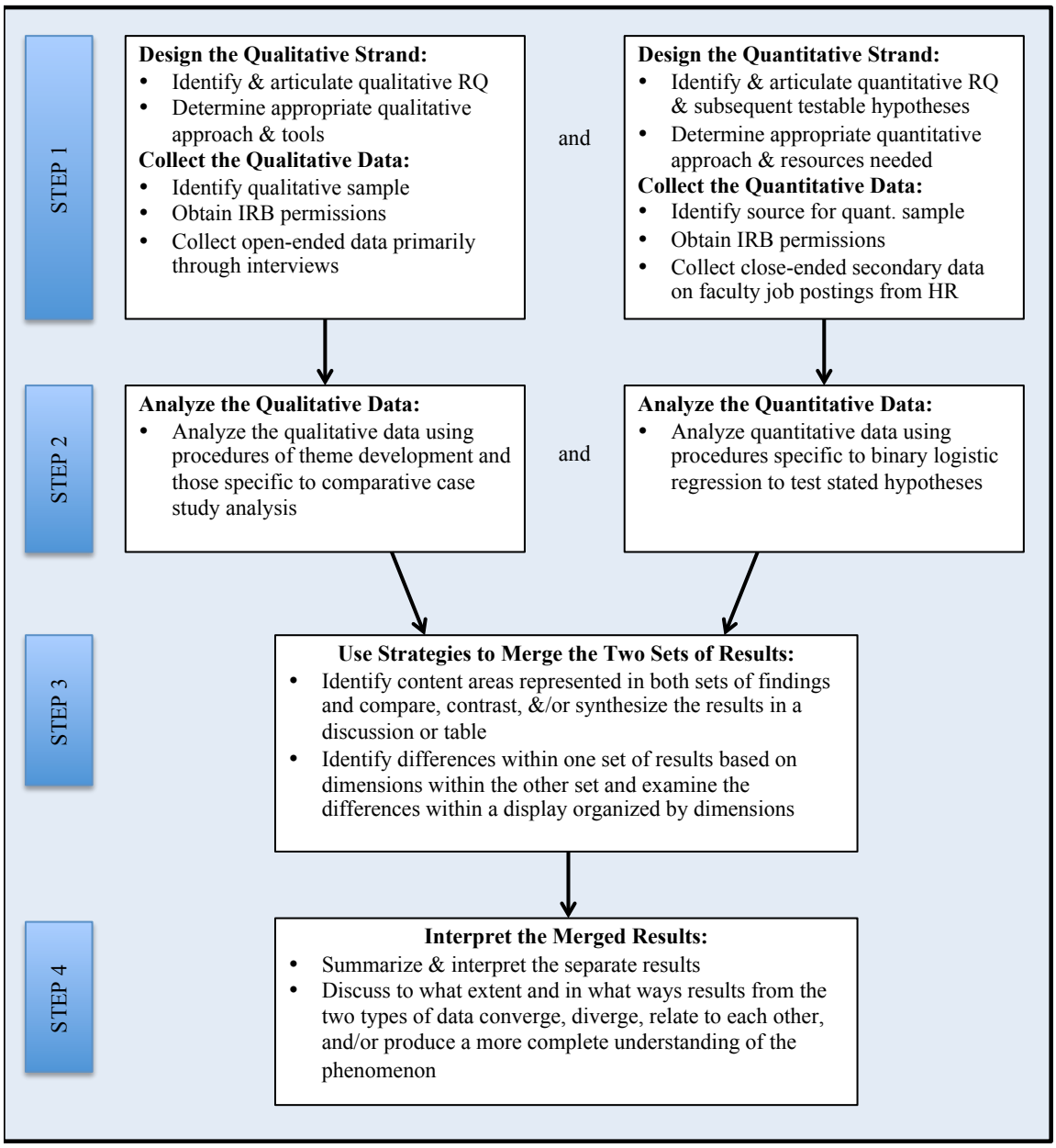


Figure 5. Flowchart of Procedures for Implementing a Convergent Parallel Design for Examining STEM Women Faculty and Faculty of Color Recruitment and Hiring Practices (Adapted from: Creswell & Plano Clark, 2011, p. 79)

Data Management

As Creswell and Plano Clark (2011) continuously reiterate that mixed methods research poses two major challenges: expertise necessary for execution of the study and data management

skills. As can be inferred, it is necessary to possess sufficient expertise in both qualitative and quantitative methodologies in order to successfully execute a mixed methods study. Aside from technical skills, the amount of data generated in a mixed methods study can be difficult to manage if a plan is not crafted from the beginning.

I have established a *cloud-based* folder, which my home campus maintains and provides unlimited storage capacity, for the safest collection site for my data. I established an electronic database (on Excel) to help organize and collect all of my case study data (i.e., interviews, memos, field notes), as well as the job postings database and any memos and field notes that are collected during the development and coding of the job postings dataset. This organizational strategy helps to enhance the reliability of my findings, especially those of my case study analyses (Yin, 2014), and will provide a common space for an additional researcher to assist with interreliability in the coding necessary of both strands[16]. Organizing the data in one secure location will allow for ease of finding and strength of quality in the study's analytic stages.

Limitations

As with any study, limitations are a constant. There are four main limitations to this study. The first two limitations have the largest impact on the quantitative strand. First, the universities unfortunately do not systematically collect data on the composition of the search committees. As discussed in Chapter II, the composition of the search committee can have significant impact on recruitment and hiring strategies for faculty (Smith, 2000; Turner, 2002). The literature underscores the symbolic and experiential benefits of having a compositionally diverse search committee when aiming to hire a faculty member from a historically

[16] I was fortunate to have been funded and supported institutionally through the Graduate Division and the DTG to have a coding partner for my quantitative content analysis, and also another research partner to be a coding partner for the qualitative interviews.

underrepresented group. Therefore, without this data, the analyses of the models presented could be limited in perspective.

Second, the data archived in the human resources databases only saves the last version of any job posting language. Therefore, if a posting was revised over time, or changed in any way to include or exclude markers of diversity, the current data is not indicative of such possible changes. Considering that as leadership changes or as departments learn of new strategies or from prior errors, change is eminent. It is completely plausible that some of the job postings (especially those that are coded as "extensions" or "reposts" under the posting status variable) may have contained different language in prior versions of the postings. Unfortunately, these data are not accessible, and therefore pose a limitation in the way I might able to consider time as a possible variable in this study.

The third limitation impacts the qualitative strand most significantly. When studying social phenomena, such as recruiting and hiring practices, it is best to draw data from more than one source to enhance the quality of the findings. In a study like this, it would have been ideal to observe a current recruitment and hiring process for each of the cases. Unfortunately, timing is prohibiting this, as I am not aware of any upcoming faculty postings in either department. Also, garnering access to such a confidential space and process is often extremely challenging. However, having observational data from a recruitment and hiring process in each of the departments would have been ideal.

Summary

In conclusion, based on the primary research question seeking to better understand the approaches that STEM departments/school that are working to attract more women faculty and/or faculty of color take, a mixed methodology research design was the most appropriate for

this phenomenon. Furthermore, in addressing the sub-questions quick invoked qualitative methods and quantitative methods, of equivalent weight in informing the overall study, convergent parallel design (Creswell & Plano Clark, 2011) was identified as the ideal for this study. As such, the qualitative strand will be implementing a comparative case study analysis to gather insights on actions that department chairs and/or deans of units that have positively deviant tendencies take to motivate change in the recruitment and hiring practices for faculty when diversification is the primary goal. Furthermore, the quantitative strand will be implementing an OLS regression analysis to understand the potential influence that the job posting has on the development of a more diverse applicant pool. While a binary logistic regression as the method of analysis in understanding whether a woman and/or person of color was hired, in STEM departments, will be used. Collectively, this convergent parallel design will provide the strongest, most context-rich, and generalizable findings to inform this topic – diversification approaches for STEM department faculty.

Chapter IV: Quantitative Results

Overview

This chapter discusses the results generated from all of the quantitative analyses outlined in Step 2 of the study design (see Figure 2). More specifically, these results align with the analyses conducted as discussed in Chapter III and outlined in the procedures for implementing a convergent parallel design for examining STEM women faculty and/or faculty of color recruitment and hiring practices. The first section provides descriptive analyses of the data used in this study, including: job postings (N=724), applicant pool (N=4,953), and hires (N=597). The descriptive analyses provide a landscape for understanding the scope of the potential impact of job posting language on the development of a more diverse applicant pool (i.e., more women and/or applicants of color), and the potential for a diverse hire (i.e., women and/or faculty of color, as defined earlier).

The second section of this chapter provides a rationale for not implementing an OLS regression analysis as originally designed, and the findings generated from more appropriate method of analysis – the zero-inflation negative binomial (ZINB) regression analyses – to better understand the impact of various covariates (i.e., scope of research, diversity statement, signals of support structures) on the dependent variable (i.e., proportional diversity of applicant pool), while controlling for various factors (i.e., discipline, posting status, year, job title, department). The results from these analyses work to confirm the hypotheses (H_1-H_3) delineated in Chapter III. Furthermore, these findings work to substantiate the recommendations argued in the extant

higher education literature on diverse faculty hiring practices that encourage strategies for the development of a diverse applicant pool (cite Stewart et al., and others).

The final section of this chapter presents the findings from the Binary Logistic Regression analyses defined in Chapter III (see Table 2, Step 2). These analyses consider the potential impact of the same explanatory variables (i.e., scope of research, diversity statement, signals of support structures) on the dependent variable (i.e., hiring of a woman and/or faculty member of color) while controlling for various factors (i.e., discipline, posting status, year, job title, department). The results of these analyses test hypotheses$_{4\text{-}6}$ delineated in Chapter III. The findings presented in this chapter aim to answer the research sub-question: *Does the wording of job postings affect the composition of the applicant pool, and hiring, in STEM departments?*

Descriptive Statistics for Samples: Understanding the Datasets

In testing these hypotheses, a clear understanding of the data included in each of the samples is critical. The descriptive analyses of job applicants' self-reported demographics (i.e., gender and race/ethnicity) by disciplinary-type positions (i.e., STEM, non-STEM) are included in Table 1. Of the total applicant pool for tenure track or tenured positions between 2010-2016 (N=4,953), and after accounting for positions that lacked variance in the pool (i.e., had only one applicant, or had only diverse applicants), the total proportion of applicants for STEM positions was 10.7%. Twenty-three and one-tenth percent (23.1%) of these total applicants (n=503) self-reported as women and/or applicants of color. Comparatively, for non-STEM job postings 34.4% of the total applicants for these positions (n=4,450) self-reported as women and/or applicants of color. Since I cannot assume or project the gender and/or race/ethnicity of a person who has self-selected to either not report or to remain unknown, these data have been excluded from the proportion of both diverse applicants (i.e., women and/or people of color) and non-

underrepresented applicants (i.e., men, White, and/or Asian American). The proportion of applicants with unidentified/unknown demographics is 20.6% (n=1,022) of the total applicant pool.

Table 1. Job Posting Applicants Demographics by STEM/Non-STEM Discipline (N=4,953)

	Discipline						
	STEM			Non-STEM			
Gender	URM	Non-URM	Non-Disclose	URM	Non-URM	Non-Disclose	*Total*
Female	11	75	1	235	982	101	*1405*
Male	25	221	8	257	1547	156	*2214*
Unknown	5	62	95	57	454	661	*1334*
Total	*41*	*358*	*104*	*549*	*2983*	*918*	*4953*

When analyzing the demographics of the faculty hired into tenure track or tenured positions, a different dataset was considered. In these data, 36.2% of the total population hired into these positions (N=597) was for STEM positions. Accordingly, 33.8% (n=73) of the new STEM faculty hired between 2010-2016 self-identified as women and/or people of color. Conversely, 50.7% of all new non-STEM faculty hires (n=381) self-identified as women and/or people of color[17]. As in the case of the applicant pool data, I am unable to attribute a gender or racial/ethnic identifier to those employees that have chosen not to be identified (i.e., non-disclose, unknown) and can therefore not include them in either statistic for diverse or non-diverse hire. Of this total population, the unidentified personnel account for 1.7% (n=10) of the tenure track or tenured faculty hired between 2010-2016. The descriptive analyses of hired faculty members' self-reported demographics (i.e., gender and race/ethnicity) by disciplinary-type positions (i.e., STEM, non-STEM) are included in Table 2.

[17] It is noteworthy to mention that the largest proportion of this hired percentile (37.3%) were non-minoritized women, which have traditionally not been considered underrepresented in most non-STEM fields. I included White and Asian American women in this comparative figure in an effort to present parallel statistics.

Table 2. Demographics of Hired Faculty by STEM/Non-STEM Discipline (N=597)

	Discipline						
	STEM			Non-STEM			
Gender	URM	Non-URM	Non-Disclose	URM	Non-URM	Non-Disclose	*Total*
Female	3	60	0	14	142	1	*220*
Male	7	137	0	24	184	0	*352*
Unknown	3	6	0	13	3	0	*25*
Total	*13*	*203*	*0*	*51*	*329*	*1*	*597*

The impact of the covariate, *presence of a diversity statement(s)*, is tested on development of a diverse applicant pool and subsequent hire (in hypotheses 2 and 5, respectively), understanding the descriptive analysis of the distinct types of statements is important. Table 3 includes the results of the descriptive analysis of frequency of diversity statement inclusion per job posting (see Appendix B for full details for diversity statements). Of the total tenure track or tenured positions posted between 2010-2016 (N=724), 47.5% included at least one diversity statement (i.e., A-G as noted in Table 3) in the wording of the job posting. Statement B, which mentions the university's commitment to dual career couples, is the most frequently mentioned, with an inclusion rate of 26.4% of the total job postings considered. Statements A and D that address the college and/or university's commitment to diversity more broadly within teaching, research, and ways of knowing are included at a rate of 17.0%, collectively. Statements C, E, F, and G are sparingly included in the job postings at a rate of 1.8% and lower.

Table 3. Incidences of Specific Diversity Statements by Job Postings (N=724)

	Statement							
	A	B	C	D	E	F	G	None
Frequency of job postings including diversity statement(s)	46	191	5	77	13	8	4	380

Zero-Inflated Negative Binomial (ZINB) Regression Results: The Relationship Between Job Posting Language and Diverse Candidates Applying

While the initial design intention for this study was to assess Hypotheses 1-3 via OLS regression, due to the nature of the data, I selected a more appropriate method of analysis. This section provides the rationale as to why the Zero-Inflated Negative Binomial (ZINB) is the ideal method of analysis for these data.

The results of these analyses presented in the previous section point to indicators that show an effect on the recruitment and development of a more diverse pool for STEM tenure-track or tenure positions. With this in mind, it is critical to consider the impact that the wording might have on readers (i.e., potential applicants) as a means of persuading them to submit a formal application. As the higher education literature indicates, expressed scope of research, inclusion of diversity statements, and signals of support structures in the wording of the job posting may influence a person's perspective on applying for a position (Stewart et al., 2004, 2007). Thus, these indicators are tested, and the results are presented in the following sub-sections as they relate to appropriate hypothesis.

Regression Diagnostics

Prior to conducting the hypothesis testing, I conducted a series of model-fit tests on my full model, which included all of the variables in my unrestricted model (see Model 4, Chapter III). As discussed in Chapter III, upon recognizing that the dependent variable data were skewed and showed evidence of kurtosis, the method of analysis shifted from the initially intended Ordinary Least Squared (OLS) regression to a method more appropriate for overdispersed count data– Poisson Regression[18]. Upon initial examination of the data, I noticed an excess of zero

[18] I selected a Poisson distribution over a Gaussian (normal) distribution because of the nature of the data. Specifically, the dependent variable is a count variable and represents the frequencies of

counts. Since Zero-Inflated models are used to model count data that has an excess of zero counts, I considered whether a Zero-Inflated Poisson (ZIP) or a ZINB best fit the dispersion of the data. Thus, since the variance is much larger than the mean (i.e., the data are overdispersed), then it is reasonable to proceed with the ZINB analysis (Long, 1997; Long & Freese, 2006). This assessment was following the required model-fit results (Long, 1997; Long & Freese, 2006). Figure 6 depicts the dispersion of diverse applicants per job posting, with a high incidence (n=91) of positions that recruited no diverse applicants into their pool.

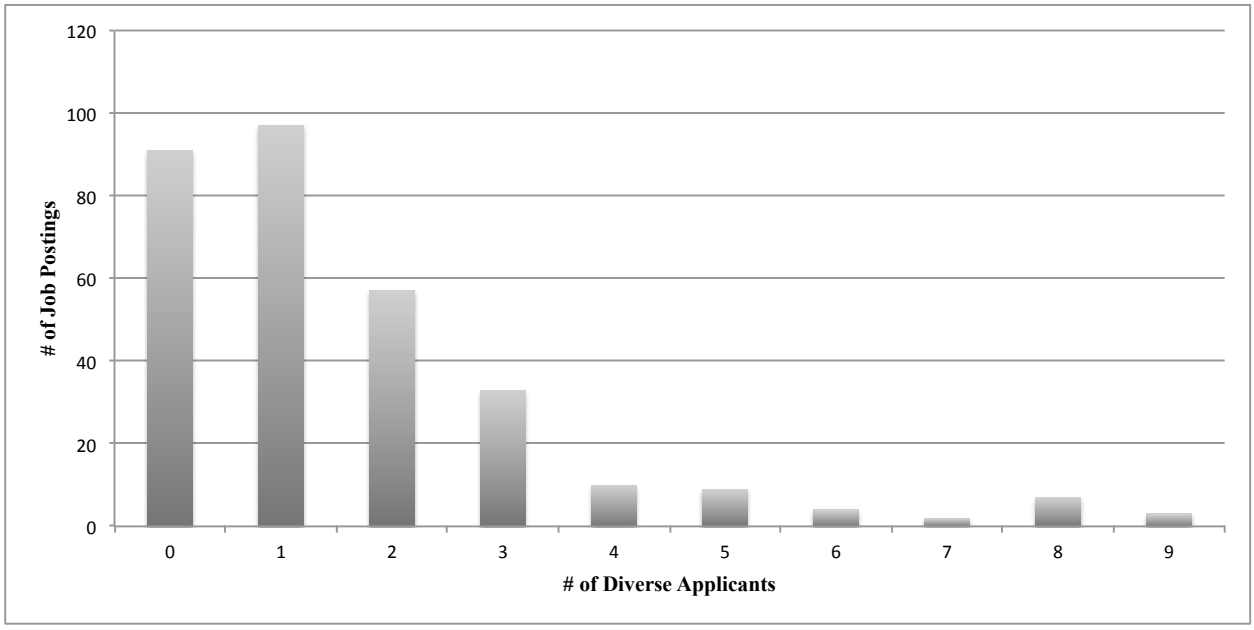


Figure 6. Distribution of Diverse Applicants per Job Postings

Goodness-of-Fit Tests for Overdispersed Count Data. The two tests explored for significant results indicating use of Poisson regression or negative binomial regression were the

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some event or state. In this case, the dependent variable can only be represented by discrete values, is a non-negative number, and is inherently right-skewed (Long, 1997).

Deviance goodness-of-fit test and the *Pearson goodness-of-fit* test. Both goodness-of-fit tests results are significant ($p \leq 0.001$), specifying that the Negative Binomial regression is favored as the appropriate method of analysis over the Poisson regression, based on these data (Long, 1997; Long & Freese, 2006).

Due to the numerous incidences of no diverse applicants, I tested whether the Zero Inflation Negative Binomial (ZINB) regression or the Zero Inflated Poisson (ZIP) regression was the best fit. A *Hosmer-Lemeshow (H-L) goodness-of-fit* test is explored, specifying 10 groups (to assess the predictive accuracy within each decile). The small H-L Chi-square value (H-L $Chi^2=7.55$) and large p-value ($p=0.4785$) suggest that the ZINB regression is a better fit than the ZIP regression for these data. Furthermore, the *Vuong* test, which compares the ZINB with the ZIP regression model, corroborates with the H-L results. As such, the significant z-test ($z=2.74$, $p \leq 0.01$) signals that the ZINB regression is the favored fit for these data (Long, 1997).

$Hypothesis_1$: Scope of Scholarly Specialization and the Development of a Diverse Applicant Pool

When testing for $Hypothesis_1$, I examine the scope of scholarly specialization (i.e., broad, relatively broad, narrow – serves as the comparison) in relation to the potential to encourage a woman and/or person of color to apply for the tenure track or tenured position posted. These covariates were considered while holding all other variables (i.e., discipline, posting status, year, job title, department) constant. This hypothesis was tested through Model 1. The evidence (see Table 4) does not support $Hypothesis_1$, in stating that the broader the stated research scope within a posting, the more likely a woman and/or person of color is to apply.

Though the covariate of choice does not produce significant results, several of the control variables considered do. Each of the following control variables – posting status (i.e., extension,

Table 4. Zero Inflated Negative Binomial Regression Analysis of Indicators for the Development of a More Diverse Applicant Pool (N=313)

	Model 1	Model 2	Model 3	Model 4
Scope				
Broad	-0.1086			-0.1152
	(0.1397)			(0.1424)
Relatively broad	-0.1387			-0.1380
	(0.1400)			(0.1378)
Diversity Statements				
Occurrence		0.0812		0.0502
		(0.0551)		(0.0864)
Presence		-0.0797		-0.1144
		(0.1885)		(0.1981)
Signals of Support Structures				
Cluster Hire			-0.0487	-0.0662
			(0.1185)	(0.1228)
Statement B			0.1594*	0.1113
			(0.0811)	(0.1656)
Posting Status				
Extension	0.4398*	0.4567*	0.4601*	0.4733*
	(0.1877)	(0.1853)	(0.1832)	(0.1860)
Repost	0.3529*	0.3451	0.3284	0.3143
	(0.1799)	(0.1771)	(0.1772)	(0.1781)
STEM	-0.5352***	-0.5508***	-0.5228***	-0.5250***
	(0.1301)	(0.1293)	(0.1313)	(0.1317)
Year	0.0613*	0.0475	0.0487	0.0470
	(0.0298)	(0.0303)	(0.0300)	(0.0305)
Job Title	0.0003*	0.0003	0.0003*	0.0003*
	(0.0001)	(0.0001)	(0.0001)	(0.0001)
Department	1.00e-06	1.36e-06*	1.54e-06**	1.49e-06*
	(5.20e-07)	(5.45e-07)	(5.71e-07)	(5.82e-07)
χ^2	44.93	47.36	47.69	49.18
Log likelihood	-501.9681	-500.7514	-500.5860	-499.8434

*p≤.05, **p≤.01, ***p≤.001. Standard error in parentheses. Marginal effects indicate the change in possibility of an underrepresented or female candidate applying.

repost), year, and job title – indicates significant findings at the 95% level ($p \leq 0.05$). In addition, discipline (i.e., STEM) is significant at the 99.9% level ($p \leq 0.001$). More specifically, these findings suggest that for every unit increase *extension* status there is an expected increase in log-count of diverse applicants of 0.4398, and a log-count increase is noted for every *repost* status unit of 0.3529. Similarly, the data indicate that for every *year* that passes there is a projected 0.0613 log-count increase of acquiring a diverse applicant, and a log-count increase of 0.0003 for every *job title* unit increase noted. While all of these control variables indicate a positive association with the production of diverse applicants, STEM (i.e., discipline) does not. For every STEM unit increase, a log-count decrease of 0.5352 is noted in the probability of recruiting diverse applicants. This means that a job posting containing a broad range of scholarly specialization does not encourage more women and/or people of color to apply for STEM tenure track positions.

Hypothesis$_2$: Diversity Statements in Job Postings and the Development of Diverse Applicant Pools

When testing for Hypothesis$_2$, I consider two independent variables (i.e., occurrence and presence of diversity statements) in relation to the development of a more diverse applicant pool. As detailed in Chapter III, *occurrence* refers to the number of times a diversity statement is included per job posting. Conversely, *presence* merely accounts for the dichotomous inclusion of any diversity statement (present=1) within any section of the job posting. This analysis was tested through Model 2. The ZINB regression analysis results do not support Hypothesis$_2$, in substantiating that the inclusion of a diversity statement (broadly) is associated with the development of a diverse applicant pool. Statistical details are presented in Table 4.

Whereas the independent variables of choice are not significant, several of the control variables do have statistically significant results. Both posting status (extension) and individual

department are significant at the 95% level ($p \leq 0.05$). Moreover, STEM is significant at the 99.9% level ($p \leq 0.001$). To understand the association of these variables with the increase in women and/or people of color applicant count, the results indicate that for every *extension* unit increase, a 0.4567 log-count increase is noted. Likewise, for every *individual department* unit increase, a 1.36e-06 log-count increase is also evidenced. Conversely, for every *STEM* unit increase, a 0.5508 log-count decrease is observed. This means that posting status, and department are significant indicators influencing the development of a more diverse applicant pool for tenure track positions in STEM.

Hypothesis$_3$: Signals of Support Structures and the Development of Diverse Applicant Pools

In the analysis for Hypothesis$_3$, I include two variables (i.e., cluster hire and statement B) to represent signals of support that an applicant may read. As delineated earlier in Chapter III, *cluster hire* includes positions that are formally coined as "cluster hires," in addition to postings that note multiple hires within the same unit. In an effort to measure the amelioration of the chilly climate that is noted in the higher education literature as highly indicative of faculty of color attrition patterns (Greene & Stockard, 2010; Griffin & Reddick, 2011; Griffin et al., 2011a, 2011b; Niemann, 1999; Reyes & Halcon, 1988; Stanley, 2006; Turner et al., 1999), a sense of camaraderie positively impacts retention of underrepresented faculty, and could lead toward an inclination for them to apply for a position. *Statement B* in particular points to the university's support of hiring dual-career couples, thus signaling a sense of support from the outset. The evidence does support Hypothesis$_3$, as the presence of *statement B* (i.e., the university supports dual career couple) indicates a significant association with the development of a diverse applicant pool at the 95% level ($p \leq 0.05$). This analysis is tested through Model 3, and statistical findings are displayed in Table 4.

While *cluster hire* is not a significant indicator of the recruitment of diverse applicants, the inclusion of *statement B* (specifically) is. Moreover, the findings indicate that for every unit increase in *statement B*, a log-count increase of 0.1594 is associated with the recruitment of a diverse applicant. Furthermore, of the control variables, a couple of them (i.e., extension, job title) are significant at the 95% level ($p \leq 0.05$), one (i.e., department) is significant at the 99% level ($p \leq 0.01$), and one (i.e., STEM) is significant at the 99.9% level ($p \leq 0.001$).

What does this signal about the recruitment of diverse applicants? According to Model 3, for every *extension* posting unit increase, a 0.4601 log-count increase is also noted. As *job title* units increase, there is also an associated log-count increase of 0.0003. For *individual departments*, while the numerical increase is small, the statistical significance underscores its importance; therefore, for every *individual department* unit increase there is a 1.54e-06 log-count increase in the probability that a diverse applicant will apply. Conversely, for every *STEM* unit increase, there is an associated noted 0.5228 log-count decrease. Therefore, the presence of *statement B* in particular is a significant indicator of the potential for a STEM department/school to hire a woman and/or person of color for their open tenure track position.

Unrestricted Model

Considering that the results do not support 2 of the 3 hypotheses posed, testing an unrestricted model with all covariates of choice and control variables is of interest. The unrestricted model is tested through Model 4 (see Table 4 for statistical results). In this ZINB regression analysis, the findings corroborate with the evidence presented in Models 1-3.

In this analysis, 3 of the control variables (i.e., extension, job title, department) are significant at the 95% level ($p \leq 0.05$), and one control variable (i.e., STEM) is significant at the 99.9% level ($p \leq 0.001$). To understand the relationship between these control variables and the

recruitment of additional diverse applicants, I consider the findings. For each posting *extension* unit increase, a noted 0.4733 log-count increase is evidenced. Likewise, for every *job title* unit increase, a 0.0003 log-count increase is associated, as is a log-count increase of 1.49e-06 for each *individual department* increase. However, for every *STEM* unit increase, a log-count decrease of 0.5250 is associated with the recruitment of diverse applicants.

Consistency in the significance of impact of numerous control variables is evidenced in the ZINB regression analyses conducted on Models 1-3 and the unrestricted model. It is evident that extended postings, job titles, and departments are having a positive impact on the recruitment of diverse applicants, while a negative association is still noted between STEM disciplines and the recruitment of diverse applicants. It is with this in mind that I seek insights from my qualitative findings to provide a richer depiction of what may be happening "behind the scenes" as well as in the cases of positive deviance that I investigate.

Binary Logistic Regression Results: The Relationship Between Job Posting Language and Diversity STEM Faculty Hires

The results of these logistic regression analyses are more indicative of organizational values than individual perceptions. Since the department/unit is more involved in the routines that transpire between the application process and the formal hire than they are prior to the receipt of the application, the results of these analyses can be indicative of organizational values and core beliefs. As with the impact of the wording of the job posting on the development of a diverse applicant pool, these sets of analyses consider the possible association of the indicators (i.e., scope of research, diversity statement, and signals of support structures) and the hiring of a woman and/or faculty of color for STEM tenure-track/tenure positions.

Model-fit Tests

Several model-fit tests were estimated in comparing the restricted (as measured by Model 1) and unrestricted models for diverse-faculty hires.

Hosmer-Lemeshow Test. A Hosmer-Lemeshow (H-L) goodness-of-fit test is explored, specifying 10 groups (to assess the predictive accuracy within each decile). The small H-L Chi^2 value (H-L Chi2=11.35) and large p-value (p=0.1824) suggest that the restricted model is a better fit than the unrestricted model for these data.

LROC and LSENS Tests. The results from the LROC graph indicate that the restricted model is a fair fit for these data. With 70% of the area represented under the curve, the LROC statistic indicates that the restricted model for diverse faculty hires is a reasonable fit for these data. Furthermore, the results from the LSENS graph (and correlated statistical results) indicate that the restricted model has high specificity (72.33%) and fair sensitivity (53.20%). This indicates that the model will predict cases of non-diverse faculty hires more accurately overall. These LSENS results were estimated with a cutoff of 0.50, in providing the most accurate estimates for these data and models.

$Hypothesis_4$: Scope of Scholarly Specialization and Diverse STEM Faculty Hires

To test $Hypothesis_4$, I examined the impact of scope of scholarly specialization expressed in the job posting in relation to the hiring of a woman and/or person of color. As described in Chapter III, scope of scholarly specialization is measured on a categorical spectrum between broad, relatively broad, and narrow in Model 5. (See Appendix A for examples of each scope category.) This hypothesis was derived from the higher education literature on the diversification

of STEM faculty (Stewart et al., 2004, 2007) which claims that the broader the scholarly scope is, the more likely a unit is to develop a diverse applicant pool.

The evidence, based on the binary logistic regression, does not support this hypothesis. Table 5 depicts the statistical findings. While the covariate of choice (i.e., scope) was not significant, this analysis does indicate that STEM (i.e., discipline) is statistically significant at the 99.9 percent level ($p \leq 0.001$). Moreover, the results indicate that for every unit increase, STEM units/departments are 50.7% less likely to hire a woman and/or faculty member of color for their posted tenure track or tenure positions. This corroborates the higher education literature (Burrelli, 2008; Stewart et al., 2004, 2007) and national data (NCES, 2013) that underscores the issue at hand with inequities in hiring practices for underrepresented faculty in STEM.

Hypothesis$_5$: Diversity Statements within Job Postings and Diverse STEM Faculty Hires

When testing for Hypothesis$_5$, I considered the value of including one/any of the 7 suggested diversity statements for job postings (in the CEDE Handbook for Faculty Hiring) in relation to hiring a diverse faculty candidate for the posted position. This analysis was tested through Model 6. As evidenced in Table 5, the independent variable of interest (i.e., presence of diversity statements) does not have a statistically significant influence on the hiring of a diverse candidate. Therefore, the evidence does not support Hypothesis$_5$, which indicates that the inclusion of diversity statements in the job posting would positively affect the hiring of a diverse candidate.

This independent variable was of particular interest, as it could have pointed to some latent organizational values regarding diversity that could manifest throughout different parts of the recruitment and hiring process. While this variable was not significantly associated with the

Table 5. Logistic Regression Analysis of Indicators for the Hiring of More Diverse STEM Faculty (N=597)

	Model 5	Model 6	Model 7	Model 8
Scope				
Broad	1.0497			1.0937
	(0.2292)			(0.2421)
Realtively broad	1.2983			1.3111
	(0.2634)			(0.2690)
Diversity Statement(s)				
Presence		1.3890		1.7644*
		(0.2607)		(0.5001)
Signals of Support Structures				
Cluster Hire			1.1227	1.0886
			(0.2134)	(0.2090)
Statement B			1.0732	0.7798
			(0.1501)	(0.1642)
Posting Status				
Extension	0.8829	0.7612	0.8080	0.7220
	(0.3286)	(0.3047)	(0.3214)	(0.2968)
Repost	1.2282	1.1456	1.1812	1.2157
	(0.4669)	(0.4323)	(0.4479)	(0.4679)
STEM	0.5073***	0.4999***	0.4965***	0.4776***
	(0.0930)	(0.0920)	(0.0938)	(0.0914)
Year	1.0516	1.0506	1.0508	1.0616*
	(0.0305)	(0.0301)	(0.0308)	(0.0324)
Job Title	1.0002	1.0002	1.0002	1.0002
	(0.0002)	(0.0002)	(0.0002)	(0.0002)
Department	1.0000	1.0000	1.0000	1.0000
	(7.58e-07)	(8.09e-07)	(8.38e-07)	(8.62e-07)
R^2	0.0294	0.0309	0.0279	0.0350

*p≤.05, **p≤.01, ***p≤.001. Measured in odds ratios. Standard error in parentheses.
Marginal effectsindicate the change in possibility of effecting a diverse faculty hire.

hiring of a more diverse faculty, STEM (control variable) is significant at the 99.9% level ($p \leq 0.001$). Model 6 provides evidence that STEM (as a broader discipline) is 49.99% less likely than non-STEM to hire a woman and/or faculty member of color for a posted position. Once again, this aligns with the findings from Model 5, as well as with the higher education literature (Burrelli, 2008; Stewart et al., 2004, 2007) and national data regarding STEM faculty demographics (NCES, 2013).

Hypothesis$_6$: Signals of Support Structures and Diverse STEM Faculty Hires

In testing for Hypothesis$_6$ the impact of signals of support structures on diversity hires, I considered two covariates (i.e., cluster hire and statement B) in the analysis. Cluster hire measures for wording or signals of formal cluster hires within units or across the university, and also for inclusion of positions that mention multiple hires within their unit (without the formal cluster hire). Statement B refers to the suggested recruitment strategy that states the inclusion of language regarding the university's responsiveness to the "needs of dual career couples" (referenced in the CEDE Handbook for Faculty Hiring). As discussed in Chapter III, each of these covariates signals that the newly hired faculty member will have an embedded support structure, either on campus or at home. This hypothesis was tested through Model 7.

The evidence for this analysis does not support Hypothesis$_6$. Neither of the covariates of interest shows significant results in association with hiring a diverse candidate. However, once again, STEM (as a discipline) is statistically associated with diverse hires. In Model 7, STEM is 49.65% less likely to hire a woman and/or person of color for a faculty vacancy than non-STEM counterparts. These results are significant at the 99.9% level ($p \leq 0.001$).

Unrestricted Model

Although the goodness-of-fit tests indicated that the restricted model was the best fit for the data, I consider an unrestricted model analysis to better understand if other latent effects could be impacting some of the prior results or other limitations, and whether these factors in combination might produce an effect is not obvious when examining the predictors by themselves. While I could not test for these limitations within the scope of this study, I was interested in the potential for the results of this analysis to point to implications for future research. In analyzing the unrestricted model (Model 8), I included all independent variables of choice from prior models (i.e., scope, diversity statements, signals of support) and all control variables (i.e., discipline, posting status, year, job title, department).

The results from testing Model 8 indicate that STEM (i.e., discipline) remains statistically significant at the 99.9 level ($p \leq 0.001$) across all models. Furthermore, and distinct from prior model analyses, the presence of diversity statements and year are each statistically significant at the 95% level ($p \leq 0.05$). More specifically, STEM is 47.76% less likely to hire a diverse faculty member for an opening than non-STEM counterparts on campus. For every unit increase in the presence of diversity statements in the job posting, departments/units are 76.44% more likely to hire a diverse faculty member. In addition, the evidence shows that as every year passes, there is a 6.16% higher probability that a department/unit will hire a woman and/or person of color. Therefore, both *presence of diversity statements* in the job posting, and passing time (i.e., year), are indicative of a higher probability that a STEM department/school might hire a woman and/or person of color for their position.

The change noted in these results (through Model 8) points to potential latent behaviors within departments/units that are not measured in these data. While this was not the best-fit

model, it did provide evidence that more research is needed to uncover the differences in model analyses. Moreover, this could also be an indication of behaviors that can be uncovered through supplementary qualitative research.

Understanding the Quantitative Findings in Light of Limitations

As discussed in Chapter III, the quantitative data acquired for these analyses were limited at best. As noted, Midwestern University does not systematically collect all data for publically posted positions, thus making it difficult to run unequivocal analyses on the variables selected. One of the primary variables that the literature pointed to as having significant impact on the recruitment and hiring process for faculty that is missing in this study is committee composition. Knowing the demographics, faculty standing, years on campus, roles on campus, and involvement in diversity trainings on campus of each of the committee members for each of the search committees creates a much more robust understanding of the indicators associated with the development of a more diverse applicant pool and thus the potential for a woman and/or person of color hired for the open position. Furthermore, there are no data collected systematically at the university that measure the activity transpiring between the recruitment period and the hiring period. As the literature point to and the findings in the coming chapters confirm, differentiated behaviors during the recruitment period can lead to drastically different outcomes. Thus, I believe that the significant results that are presented in this chapter are a result of secondary effects not measured (i.e., unit's investment in diversity). All of the significant indicators – presence of Statement B, extended postings, job title, and department – are all feasibly connected to the individual department's/unit's desire and work toward change. For example, departments that are working toward a more diversified faculty are (probably) more

likely to include the recommended Statement B in their job postings, and to be working through personal networks behind the scenes to encourage more applicants. Thus the longer the posting period, the more likely these types of departments are to develop a more diverse applicant pool. Therefore, the significant results can feasibly be a result of such secondary effects that may not be considered in these models.

Furthermore, the significant results from the analyses on the development of a woman and/or person of color hire based on the job posting wording are also most likely the effect of secondary effects in place. As noted in the forthcoming chapters (on qualitative results), there are many significant indicator processes and behaviors that can impact the hiring of an underrepresented faculty member (once they are in the applicant pool), that are not accounted for in the models tested in this chapter. The leap between job posting language and potential hire is quite large, thus leaving the significant findings reported with a caveat. This stipulation lies in understanding that the limitations in the data collected now create a much larger gap in drawing direct and unequivocal arguments based on these findings alone.

While the results presented in this chapter do point to potential indicators within the job posting for the development of a diverse applicant pool, and thus a woman and/or person of color hired, more robust data are necessary to further analyze the stipulated variables and models discussed in deriving more explicit implications. The findings presented in this chapter also point to the strength of this study in its mixed methods design, as the qualitative findings helps to fill the gaps that the quantitative results presented. Although the findings from these quantitative analyses serve to be strengthened in future studies, these results still contribute to the overall understanding of the approaches that STEM unit take in working toward a more compositionally diverse faculty.

Summary

This chapter presents the findings from the quantitative analyses of this study. More specifically, it details evidence of the multiple methods of analysis (i.e., ZINB regression analysis for the development of a diverse applicant pool and binary logistic regression for the probabilities of diverse hires) used to test the 6 hypotheses outlined in Chapter III. The results reported in this chapter contribute directly to answering research sub-question: *Does the wording of job postings affect the composition of the applicant pool, and hiring, in STEM departments?* To respond to this question, based on the evidence provided in this chapter, the wording of job postings can, in fact, impact the diversity of the applicant pool and hired faculty members. While most of the variables under investigation are not significantly associated with the recruitment or hiring of a diverse faculty, there are several other indicators (such as discipline, posting status, job title, and departments) that do consistently affect the composition of the applicant pool and diverse hire.

The findings in Chapter IV are paired with the findings in Chapter XI, where I present the integrated findings of both qualitative and quantitative data for a robust set of findings that can be used to understand the factors that STEM departments leverage in aiming to recruit and hire more women faculty and/or faculty members of color in Chapter XII. Moreover, Chapter XII will provide an integrated discussion of the results presented in Chapter IV. This discussion will inform the set of recommendations for praxis to be detailed in Chapter XII, and future directions for research discussed in Chapter XIII.

Chapter V: Qualitative Results – Understanding Midwestern University

Overview

This chapter will be the first in a set of 7 chapters (Chapters V through XI) that examine the findings generated through the qualitative analysis of this study's design as outlined in Step 2 of Chapter III (see Figure 6). Specifically, these findings will explicate the in-depth narrative regarding recruitment and hiring practices as shared by the identified 5 STEM departments/schools (i.e., astronomical sciences, chemistry, environmental sciences, information and library sciences, and physics) as they engage in faculty diversification efforts. As necessitated by comparative case study methodology, this chapter will present the findings as a two-stage process, first as a "within-case analysis" then as a "cross-case analysis" (Merriam, 2009, p. 204).

To leverage the richness gained through case study analyses (i.e., "in-depth description and analysis of a bounded system," such as an organization (Creswell, 2013; Merriam, 2009, p. 40; Stake, 2005), this chapter provides a thorough context of the campus, Midwestern University[19], where all 5 departments/schools are located. This campus context is a critical backdrop to the approaches that each dean and/or department chair takes to enhance the compositional diversity of the faculty within their unit. While disciplines, political environments, perspectives regarding diversity, and social structures can influence decision-making processes,

[19] Midwestern University is the selected pseudonym for the campus in this study. All participant names, units (i.e., departments, schools), programs, university, and other identifiable data have been given pseudonyms to protect the requested anonymity of the participants.

it is also important to note the influence that campus leadership, resources, and expectations have on the decision-making processes of unit leadership (i.e., deans and chairs).

As with most case study analyses, the acquired data were rich and extensive. In alignment with the higher education literature on recruitment and hiring practices for women faculty and faculty of color, the data were coded for themes in three predominant areas: leadership, organization, and diversity ethos as the primary motivators influencing the recruitment and hiring process of minoritized faculty (Delgado-Romero et al., 2007; Greene & Stockard, 2010; Griffin et al., 2011a, 2011b; Moreno et al., 2006; Smith et al., 2007; Springer, 2002; Stewart et al., 2007). However, this study focused distinctly on the insights gained from *leadership (i.e., individual approaches)* in motivating their respective units toward change in the recruitment and hiring process.

With this focus, Chapters VI through X will illuminate the leadership approaches each department/school leveraged in working toward recruiting and hiring more women faculty and/or faculty of color. In these chapters, the "within-case analyses" (Merriam, 2009, p. 204) for each of the five units (i.e., astronomical sciences, chemistry, environmental sciences, information and library sciences, and physics) will be presented – one case study per chapter. Each case will use the Competing Values Framework (CVF; see Figure 2, in Chapter II) to discuss the findings of these leadership approaches[20].

The cross-case analysis will be presented in Chapter XI, illuminating commonalities and variations in approaches taken by leadership. The CVF will be leveraged to consider these commonalities and differences. Furthermore, contextualizing the campus and each unit will

[20] While the details of the organizational-level and diversity-ethos findings will not be discussed in this study, plots of the coded data may be found in Appendix F (organizational and diversity-ethos level).

deepen the understanding of how and why leadership has chosen both similar and distinct approaches to diversifying their STEM unit. Collectively, the findings in Chapters V through XI aim to answer the research sub-question: *What have STEM deans and/or department chairs done to motivate change in recruitment and hiring practices?* These findings, in connection with the prior findings in Chapter IV (Quantitative Results), ultimately provide the insights necessary to answering the overarching research question*: What approaches do STEM departments take that are working to attract more women faculty and/or faculty of color than their disciplinary counterparts?* Since this chapter serves as an introduction to the qualitative findings, this overview provides a guide for the following chapters (VI through XI).

Institutional Context: Understanding Midwestern University

Midwestern University (Midwestern hereinafter) shares many institutional characteristics with other large public campuses around the country. However, it is unique in its deep history and unrelenting commitment to social justice and service for public good. Midwestern has long been known for its bold leadership in these areas, and for the prominent strides toward social justice and equity that it has committed to over the decades. This commitment has generated both favorable support and controversy and public debate regarding its practices to intentionally diversify the campus demographics.

Demographic Context

According to the Carnegie Classifications for Institutions of Higher Education, Midwestern is best classified as a *very high research* intensive campus with a *high graduate coexistence* population. Its undergraduate population is classified as *more selective*. Overall, Midwestern is considered to be a *four-year, large, primarily residential campus*. *U.S. News &*

World Report also consistently ranks Midwestern in the top 10 public institutions nationally on an annual basis.

Midwestern supports a total student enrollment of over 40,000 undergraduate and graduate students, combined. Individuals from all 50 states and over 100 countries make up this student population. These students enroll in close to 20 schools and colleges, for one or more of the (approximate) 300-degree programs on campus. Of these degree programs, nearly 100 of the graduate programs are currently ranked as top-10 in their respective fields and disciplines (according to *U.S. News & World Report*).

Of the undergraduate student population enrolled at Midwestern, more than half are women and fewer than 15% are students of color.[21] Comparatively, the university employs approximately 300 full-time faculty throughout the various schools/colleges and programs. Of these faculty, about 10% are faculty of color.[22] Although the campus is large and very decentralized, it prides itself on a 15:1 student-to-faculty ratio. Midwestern is a campus that also provides additional opportunities to campus-wide units (i.e., departments, schools), such as postdoctoral fellows, to support the academic experience and success of its students.

State and Local Political Context

Midwestern is located in a state where a state initiative prohibits the use of social identities (including, but not limited to race/ethnicity, gender) in the hiring process. This restriction has been in place for almost a decade, allowing university agents to find loopholes in support of their diversity efforts. Those campus leaders interested in enhancing diversity have

[21] This proportion does not include Asian/Asian American students (domestic), as in many STEM fields these students are not considered underrepresented. Furthermore, this definition of underrepresented aligns with the one used for the STEM faculty data analyses conducted in Chapter IV.

[22] The same criteria were used here to calculate this proportion as for students and the analyses in Chapter IV.

turned to legal strategies available through recruitment and retention efforts, as Springer (2002) notes in his scholarship.

Throughout its history, Midwestern has relied on its local institutional autonomy, as it is not bound by a higher education statewide system or multi-college organization. In doing so, the campus has focused heavily on the guidance of federal mandates and statutes in making decisions, especially about such contentious issues as diversity. Furthermore, with this autonomy, Midwestern also has a long history of leaning significantly on the power vested in the board of trustees as publicly elected members. While the board has historically represented both political parties, making decisions on controversial issues has often been challenging. However, Midwestern is a campus whose leadership has believed deeply in diversity and equity, and has thus worked to move the board to vote on broadening institutional practices that reflect greater inclusivity. Most prominently, in the last handful of years, Midwestern's board leveraged their constitutional autonomy and voted to adapt their in-state tuition qualifications to include students who have attended state schools and graduated from an in-state high school in the last couple of years, regardless of citizenship status. This is just one of many historical instances of support for diversity on this campus.

Institutional Focus on Diversity

As has been described, Midwestern has a long history of investment in diversity, which has brought the campus into the national limelight. Historically this campus has faced many challenges (i.e., political, legal, and social) regarding its stance on diversity, while it has also been touted as a leader in this area for these same reasons. What has truly allowed this campus to shine over the decades, despite its tumult, is the unapologetic actions of its leaders regarding diversity.

Approximately 30 years ago, the university launched a campaign to link academic excellence and diversity. This was a campus-wide approach that the leadership expected, and required, that all members of campus engage in, in an effort to diversify all campus demographics, most prominently the students and faculty. The upper-level administration at Midwestern took an apologetic approach with this effort and demanded results.

The legacy of this campaign caused ripples that continue to impact the decisions that leaders make on campus today. Although this campaign came and went, diversity agents on campus continue to refer to it as a significant historical game-changer, and it can be argued that this campaign laid the strongest foundation for current strategies.

Over the past handful of years, Midwestern has refocused on diversity efforts campus-wide and has reinvested in its current diversity and inclusion efforts. In doing so, the campus has created the inaugural role of chief diversity officer, whose role is to lead all aspects of campus diversity efforts.

Campus Resources Dedicated to Diversity

While acknowledging the many institutional resources that Midwestern has committed to efforts supporting social justice and diversity, throughout history and even currently, this sub-section will focus on the two main resources all of the case study units have used while working toward increasing the compositional diversity of their faculty that are available and accessible to all STEM units on campus: Diversity Transformational Grants (DTG) program and diversity-focused post-doctoral fellowships. These programs specifically, and their internal components, have served as launch pads for many of the case study units and are central to the faculty diversification efforts at Midwestern.

DTG is a program that was originally federally funded to assist campuses in enhancing compositional equity within their faculty. At Midwestern, when the external funding ended, the campus institutionalized the program and continued its growth, in response to evidence of great impact. DTG at Midwestern was primarily focused (in its early years) on gender equity within STEM faculty. This program hosted a team of scholarly experts in this area, whom the university tasked with diffusing empirically based strategies for enhancing faculty diversity in order to create change. As a part of this program, they offered transformational grants to deserving STEM units that made a compelling case as to why they should be funded in support of diversifying their faculty. These DTG grants were not extensive, but as will be discussed in the following section, they became seeds for some units to begin a change process that was perhaps overdue. The impact of this program (and of the transformational grants) was immense from the beginning, and it is rare to have a conversation with a STEM faculty member who is committed to diversity and does not speak to the ongoing value and expertise of DTG. In fact, Kim (one of the junior Environmental Sciences faculty) offered her personal reflection on the value of DTG:

> So with DTG at this point, I would say I feel there is a demonstrated track record of success. That they have had a very positive impact on not just the numbers in terms of hiring but also climate issues especially for women. I've learned a lot from attending workshops sponsored by DTG. They're really good about making these accessible but also bringing in experts in: What is negotiation? How to say no effectively? [Laughter] – Things that are very important for sort of day-to-day. It's not about getting hired; it is also about how do you manage the challenges that may be unique, especially to women and people of color? There are fewer faces that look familiar and so you tend to get more

> of that sort of unofficial service burden. And how do you manage that? How do you protect yourself but at the same time serve others?
>
> So I think for me I would say it is a combination of personal experience of interacting with these groups and feeling that I got good advice. There is a lot of, I think, statistically based analyses that they've done that feel grounded in science, which as a scientist I appreciate. I don't feel like these are people who are just coming in and giving me their opinions. I feel it is based on solid research. So for DTG, those are some of the reasons. You know Judy [the director] was a huge piece and that's just as one human being that projects – I mean instills confidence.

In many ways, Kim's reflection is representative of that of most of the faculty that participated in this study. It was evident that the DTG program is a significant support for all units on Midwestern's campus.

Furthermore, DTG developed several committees to address issues related to gender and racial/ethnic equity amongst faculty, one of the most notable of which has been the Committee for Enhancing Diversity and Equity (CEDE). This committee focused on the recruitment and hiring process for faculty. CEDE has developed workshops, trainings, and even manuals to assist faculty search committees with this process. They have focused on teaching faculty about unconscious bias that often inhibits a successful diversity search effort, despite concerted intentions. CEDE has provided a significant amount of research to substantiate their training sessions and their recommendations for search committees. The work of CEDE has become so widely valued across campus that now all search committee members are required to attend a

CEDE training session prior to participating on the committee. While DTG hosts CEDE as a committee, the members have always consisted of faculty interested in fostering diversity and equity. In the early years, DTG recruited select STEM faculty to help them lead this committee and to infuse additional credibility in the work. Diana (the chemistry chair) shared a deep reflection about her involvement in CEDE from its inception and about DTG's impact on the campus:

> I really think how it was set up at Midwestern was really great. Judy did a really great job and it has really significantly changed. It is true it has been uneven. Not every department has changed as much as some but I think it really has changed the way people think about diversity and have a better understanding of what critical mass is. I really think -- I mean I was always committed but I didn't know anything. You know really, it made a difference.

Midwestern has continued to invest in DTG and CEDE campus-wide due to their significant contribution to changing the way that people think about and value diversity.

The second set of major resources that Midwestern has, more recently, invested in are the STEM post-doctoral fellowship opportunities. In particular, the Intercollegiate Leader Fellowship Program (ILFP), housed out of the Office of the Provost, has been offered for nearly 5 years. This fellowship is also hosted on other *very high research* intensive campuses across the U.S., and is focused on increasing diversity within STEM faculty. The ILFP allows the fellows to focus on research for the two years of their position, and provides an opportunity for them to be considered for a tenure-track position, if an open position is posted. The number of fellowships offered across campus is very limited, and the fellows apply to the ILFP program

and then are forwarded to the school/department where they would be housed (if selected). This prestigious post-doctoral fellowship has helped several units on campus significantly increase their diversity, yet the allocations are still extremely competitive, especially in light of the size of Midwestern's campus and needs.

Similarly, the Midwestern Teaching Fellowship Program (MTFP) was designed and introduced to mirror ILFP, while expanding the resources. MTFP, distinct from ILFP, is a Midwestern campus-based program that requires the fellows to teach as well as conduct research during their two-year tenure in the position. The internal processes of the MTFP are coordinated at a university-wide level and have similarly created opportunities for several STEM units to increase the compositional diversity of their faculty in ways they might not previously have been able to. The disparate outcomes across STEM units on campus have been a result of how units utilize these resources. The following section will highlight the ways in which the units have chosen to leverage the campus-wide resources to their advantage. As is evident through this campus context, while Midwestern shares many common characteristics (i.e., demographics, political context) its historic and current commitment to diversity, equity, and inclusion highlight it as unique and its unit worthy of investigation.

Leadership Motivators: Individual-Level Approaches to Faculty Recruitment and Hiring

As scholars argue, the role of organizational leaders and the decisions they make before, during, and following the recruitment and hiring process are significant to the success of the hire (Delgado-Romero et al., 2007; Smith et al., 2007; Springer, 2002; Stewart et al., 2007). As was thoroughly argued in Chapter II, leadership decisions are especially critical for minoritized hiring, as in the case of women faculty and faculty of color in STEM. Leadership decisions extend beyond action to framing the need for internal change, strategically positioning the

organization with external actors of influence (such as deans, provost, president), and taking formal and informal leadership roles within and outside of the organization (in this case the department/school). Springer (2002) argues that this window of opportunity for legal use of social identity (i.e., race/ethnicity, gender) is a precursor to the official start of the hiring process, and thus leaders should garner this opportunity when diversification in the hiring process is the goal. The following case studies will highlight approaches that are taken by leadership (i.e., department chairs, school deans/associate deans, administrators, prior chairs and deans) when attempting to recruit and hire more women faculty and/or faculty of color.

Participant Characteristics

In an effort to clearly understand the gender and role characteristics of the 22 faculty members and leaders that participated in this study, Table 6 illustrates these by unit on campus. As noted, 4-5 participants from each department/school agreed to engage in the 30- to 60-minute semi-structured interviews. While each unit differed in ratio of faculty to leaders, overall the sample included 12 faculty members and 10 leaders (evenly split by gender). Important to note, a leader represents a faculty member that holds a formal leadership role in the unit (or on campus) and/or that previously held a formal leadership role in the unit. The formal leadership role titles include chair, dean, and director. The participants' race/ethnicity was not noted, as these data were not gathered; however, only one faculty member self-identified as a person of color (specifically, African American).

Table 6. Characteristics of Interview Participants by Unit, Role, and Gender

	FACULTY		LEADER		
UNIT	Male	Female	Male	Female	TOTAL
Astronomical Sciences	1	3	1	0	5
Chemistry	2	1	0	2	5
Environmental Sciences	1	1	1	1	4
Information & Library Sciences	1	0	1	2	4
Physics	1	1	2	0	4
TOTAL	6	6	5	5	22

As noted previously, all identifiable data (including the names of the campus, units, programs, and participants) are presented pseudonymously[23] to protect the confidentiality of the participants. As a reference, Table 7 provides a list of pseudonymous names of individual participant, along with their unit and the role they represent.

Summary

This chapter provided a thorough context of Midwestern as the campus where all 5 cases for this study are located. Since context is critical to qualitative analysis, understanding Midwestern's history, stance on diversity, and distinguishing characteristics are important to the upcoming analyses presented in the following case studies. As discussed in the overview of this chapter, the following 5 chapters (VI through X) will provide the "within" case study analysis for each department/school in this study. Chapter XI will conclude the qualitative results chapters with the cross-case analysis.

[23] In accordance with qualitative methodology, anonymity is a high priority unless granted permission by all participating parties (Merriam, 2009).

Table 7. Characteristics of Interview Participants by Unit, Name, and Role

UNIT	PARTICIPANT*	ROLE
Astronomical Sciences	Marc	leader
	Valeria	faculty
	Tracy	faculty
	Stella	faculty
	Jim	faculty
Chemistry	Diana	leader
	Judy	leader
	Luke	faculty
	Steve	faculty
	Nicki	faculty
Environmental Sciences	Rian	leader
	Esther	leader
	Kim	faculty
	Jeff	faculty
Information & Library Sciences	Liz	leader
	Kate	leader
	Mike	leader
	Richard	faculty
Physics	James	leader
	Matt	leader
	Jack	faculty
	Marie	faculty

*All participant and unit names have been anonymized for confidentiality purposes.

Chapter VI: Qualitative Results – The Case for Astronomical Sciences

Overview

This chapter will provide the case study analysis of astronomical sciences (AS). To better understand the approaches taken by AS's leadership at Midwestern in motivating change toward a more diversified faculty, it is critical to grapple with their diversity-related history. This case study will explicate the varied approaches the leader (i.e., chair) has taken to progress this work. The approaches will leverage the CVF for analysis, and thus will be presented as follows: competing approaches impacting rate of change, competing approaches impacting magnitude of change (see Chapter II for the detailed description of the secondary dimensions of the CVF), and distinct framing infused to guide units toward change. Figure 4 illustrates a plot of the interview emphases in which leadership (i.e., individual level) approaches are infused in the process of recruiting and hiring faculty. In each quadrant, key characteristics drawn from the data have been highlighted in an effort to highlight the alignment between the interview emphases coded and the quadrant in which they were assigned (as will be the case for the CVF representation for each of the forthcoming chapters). As is evident in the figure, AS leadership approaches are primarily collaborative and routine. The final 2 sub-sections – *Speed of Change: Tendencies Toward Long-Term Change* and *Magnitude of Change: Working Toward Routinization* – provide the evidence substantiating Figure 7.

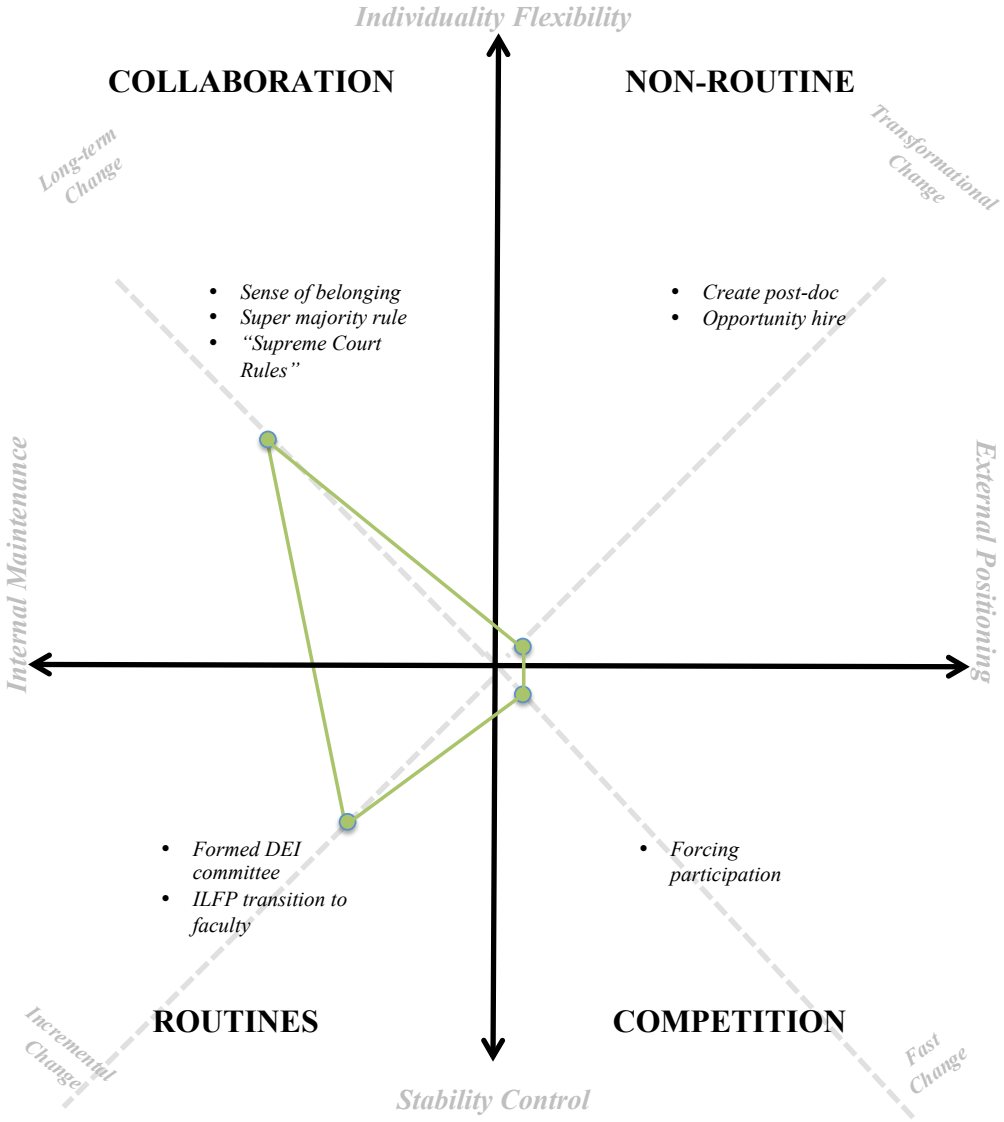


Figure 7. Competing Values Framework for the Faculty Recruitment and Hiring Process Reflecting Leadership Decision-Making in Astronomical Sciences

Historical Context: From *Then* Until *Now*

AS has a young history with regards to focused efforts on diversity. However, the field and department have much deeper historical roots at Midwestern, in fact it was one of the first

academic units on campus. While the university has a much longer history of investing in diversity efforts, AS faculty and leadership point to the past decade as the period when the department began to focus on diversification of faculty. Marc, the current chair of the department, shared the way many of the efforts began:

> You know ten years ago or so, it was a priority of the department to diversify. And so […] everybody knew it had to happen but as you are well aware there are legal issues involved that you can't just go out and hire a woman or an underrepresented minority. You have to run the search process and then there are all these factors in the search process that you just get down there and boom; you have your all white male short list. … Historically […] it certainly was activated but we were in a mode where [the chair] would hire – He would have a short list. You have a man and a woman and at the time – So what you would do is go to the dean and say, "I'll hire the man with the actual position and then we'll use the provost special money for the woman."

In many ways, the historical context regarding diversification of faculty for AS stemmed from strong leadership with bold vision. The chair at the time pressed the department in this direction, and leveraged university resources to make multiple offers. The concern as Marc shared was that this strategy was not an optimal for increasing diversity as it was actually creating a net-zero gain of women faculty. While AS was hiring more women faculty at the time, they were also hiring equal amounts of men faculty concurrently. Thus Marc reflected that the bold leadership created a strong foundation, but in order to create gains AS needed to consider different options.

Moreover, during this period, the department faced a series of key departures. Faculty recognized that many of the women that were hired were also leaving or being drawn away. Jim, a longtime faculty member in AS, reflected:

> There was this period in [the early 2000s]; we had like four women [that] left in fairly short succession. I mean all of them went to peer or better places [...] I don't think it was because they hated it here but it would be interesting what somebody who interviewed them would have heard. Like an exit interview – if there was anything else going on. Maybe there were some personal issues between some people. […] We haven't lost any faculty since then. Since [that] was like 10 years or 12 – I don't remember exactly but around 10 years ago was when that last person left. I'm just pointing to the fact that it hasn't always been the case that the women faculty has stayed […] And there were some people at other universities asking, "What's wrong with Midwestern? Why is everyone leaving?" And as far as I knew there nothing particularly wrong…I didn't think there was anything wrong particularly but, um—anyway. It was a worry at the time.

Jim's reflection indicated a moment of pause for AS. It was evident that AS was experiencing some turmoil during this period, and the significant departures of the various women faculty impacted their national reputation, as outside colleagues began to question their attrition. It was not clear whether extensive departmental reflective work was conducted on this issue, but it is clear from Jim's comment that faculty were thoughtful about the significant proportion of women faculty departures, and were impacted by it.

Furthermore, Marc recalled that the efforts during this time were primarily focused on hiring, whereas the department now sees the process as broader than just hiring. Here is how Marc recounted some of the current departmental focus:

> I would say yes [the department is open to diversity efforts] and also trying to participate internally and change our field in how it operates here and hope that diffuses elsewhere […] The success that the department has had in participating in the campus-wide programs which are the ones that diversify the faculty, as opposed to the internal stuff, is something that's happened over the past eight years or so […] And then in the past three years or so there's been concerted effort to improve the department as a whole, so to make it a welcoming environment if we were to get someone. So that we can keep them – get them to want to come, and keep them if they are here.

In contrast to Jim's previous reflection regarding the high attrition of women faculty, and the impact on national reputation, Marc's comment points to a much more intentional focus on internal climate to ensure that all faculty feel welcomed holistically. Furthermore, in a departure from previous approaches by the prior leadership, Marc focuses on elements specific to diversity and ensuring that the climate is welcoming to anyone who would want to join their faculty. Marc's story signaled the beginning of AS' broadened focus for faculty diversity efforts – away from simply hiring and toward a context that includes departmental climate and retention as recruiting and hiring strategies.

While AS had been contending with a tainted history regarding the retention of women faculty and were working toward refocusing its approach to recruitment and hiring, the context was complicated by a stifling in the hiring process. All of the faculty and leaders commented that

to-date the department had not received an open line for hire in over 10 years. There was a sense of resentment amongst some of the faculty regarding not receiving an open line for hire in over a decade, as previously noted. Jim's disapproving response when asked how long it had been since the last open hire represented the general sentiment at AS. His curt response was: "Yeah, really long – like 10 years."

Nonetheless AS has continued to see growth in its faculty and an expansion of its composite diversity, in spite of its stifled open hiring. AS credited this growth and diversification to its great success acquiring several ILFPs and MTFPs over the past handful of years. Stella, one of the several beneficiaries of the fellowship programs, spoke to the tension that the success in the non-traditional hiring strategies causes in the long-term:

> Actually, the last open hire just got tenure within the last year but there's been me and Tracy who I mentioned who have been hired through ILFP. We have someone in the department who was a spousal hire of somebody else in the university who [we] are thrilled to have, and a more senior target opportunity hire, and we have someone arriving in the fall that has a MTFP. But there is some tension in that even though the department has valued these post-doc faculty hiring mechanisms. I see some frustration among some of my colleagues that when you're successful at that, it counts towards your total faculty count and then when you do have a retirement come along that means you may be above count and you don't get to hire. You don't get an open search. So that's kind of the tension.

Stella's reflection signals the unintended consequences that develop from non-traditional hiring strategies. While the AS faculty are clearly grateful for the post-doctoral fellows they receive and

for the departmental growth it reflects, they are growing increasingly unhappy about the loss of control over the faculty hiring process that is leading to their growth. This sentiment resounded throughout AS. Marc concurred that this loss of control does not allow them to position themselves as a "hypercompetitive department in the future." Valeria, an AS faculty member who has been deeply interested in diversity issues since she began over 10 years ago, spent most of her interview reflecting on this tension. She commented on its complexity, on one hand they are grateful for the growth and opportunity that they do not want to turn away; however, AS sensed that acquiring new faculty via the post-doctoral fellows has been the primary motivator in stifling opportunity to bargain for an open line. Even Jim shared similar sentiments, corroborating the department's developed tension: "It's been a gradual thing, but just having no open hires hasn't allowed a correction, to feel [like] the department […] control of its destiny in which ways it grows." Therefore, while AS has been experiencing some success and growth through the post-doctoral programs, it continues to contend with heightening unintended consequences caused by the lack of a traditional open faculty line in over 10 years.

Leadership Framing: Purposefully Vague

In spite of the challenges, the AS chair forged forward with a keen eye on growth and on diversifying the faculty. With an expanded perspective on faculty recruitment and hiring, the chair intentionally adopted a broad, and some may even say informal, framing to encourage AS faculty to support these efforts. This framing approach has been one of the most high-impact that Marc has introduced to motivate the faculty to invest in diversification. Jim shared that while no formal framing was leveraged, the general tone that the chair has perpetuated about diversity (especially diversity hiring) is along these lines:

> I think at least that kind of statement when you advocate for underrepresented groups, often you are advocating for things that really are just good things for everyone. […] so techniques that tend to make things more predictable or be more clear of expectations, right, are really good for everyone. And it is really just that certain groups are better mentored and can handle it more. If you don't know what an interview is like, if you are better mentored, or have people who have been through it, then you'll perform better, which is not really the metric. How good advice you are getting before you come to your interview is not really the metric but it is your science and your collegiality. So there are those kinds of efforts […] When you recruit you try to come up with these ways to make it more [equitable] – at least in recruitment context, you want to give people an opportunity to show their best case. You don't want to have them trip up on your own bad organization or poor setting of expectations, right?

This reflection indeed corroborates the broad framing that Marc had been working to infuse a sense that diversity and excellence go hand in hand. Jim's reflection points to the casual tone with which Marc implements the changes in the faculty hiring process. Jim points to the importance of examples that Marc provides in trying to level the playing field for underrepresented applicants that may not present themselves in the same way as majority applicants. It is through these examples that Marc is able to infuse his framing of diversity. During an exchange, Marc shared some of the subtle ways that he has found effective while implementing this broad framing:

> The stock word is "we're going to increase in diversity and excellence at the same time." Okay so, I consistently do that but the way I set up the framing […] When we had our

> discussion – our most recent discussion for the [postdoc] hire – I put up the CEDE committees […] candidate evaluation sheet […] I put that up on the screen and I said, "Listen folks, we are valuing – We value scholarship. We value teaching ability and we value these other things as well." And I left it up on the screen for the discussion so that everybody could know there is this other component that we were paying attention to and we want to value it as much as we value the other traditional categories so it is sort of like a subtle thing […] So, I set the framing and left it up there so that the framing was obvious to everyone.

Though some might have construed Marc's broad approach as lackadaisical, he was quite intentional and strategic with all of the approaches he took with faculty regarding diversity. Marc was aware that he needed to subtly guide the faculty toward change, as opposed to force them toward it. His keen insights regarding the resistance that he faced in his department helped him understand the best approach in mobilizing his colleagues. Marc knew that he had to guide rather than lead his colleagues to change, thus having a subtle framing allowed the change to slowly seep in.

Stella, a junior AS faculty member who considers herself a "rebel in [her] field" regarding diversity issues, talked about Marc's broad approach less as a framing than as foregrounding common themes. She affirmed that the overall theme always concerns promoting social justice and reminding faculty that they need to continue evaluating their approaches in order to recruit the *best* astronomical scientists. Both Stella and Marc proudly pointed out several of the physical signals that have marked their progress toward inclusiveness as a department, including: departmental stickers and t-shirts with diversity related slogans, newer posters and

wall décor in the hallways reflecting the diversity of the field, and most markedly the gender-neutral restrooms[24] that they fought to have on their floor.

Speed of Change: Tendencies Toward Long-Term Change

In recognizing their troubled history with attrition of women faculty, and subsequently working toward creating a stronger departmental culture for diversity, AS leadership intentionally sought approaches that guided faculty to invest in diversification efforts. In analyzing the "speed of change" (one of the secondary dimensions of the CVF), it is critical to consider the varied approaches taken by the unit leadership. As illustrated in Figure 7, the interview emphases coded as collaborative leadership approaches collectively provide evidence of the approach of *creating a more equitable organizational climate*, and likewise the incidents coded as routine leadership approaches provide the evidence for *formalizing diversity as a foundation and expectation* as the approaches in creating stability and working toward incremental changes.

Collaboration: Creating a more equitable organizational climate. In guiding the unit toward the values of equity, Marc noted that he needed to ensure that all voices in the department would carry equal weight. While this may not appear as a core component of the recruitment and hiring process, Marc reflected on the hierarchies that influenced prominent spaces, such as search committees. He noted that that was especially important, as women faculty still primarily held lower-rank positions (i.e., assistant professor, associate professor) and had lower seniority in the department, as compared to their male counterparts (who tended to hold the largest portion of professorships). Moreover, equity of voiced perspectives was critical in creating long-term change within the department, as this approach aimed at changing internal structures and balance

[24] It is important to note that of all five units studied, AS was the only one with gender-neutral restrooms.

within the unit. In many ways, Marc's core intentions flow from the following sentiment that he shared: "I think that again the change in the climate locally is a very important piece of the whole thing so that when this person comes they're going to feel that they belong."

With this perspective in mind, Marc took it upon himself to find ways to ensure that a diversity of voices would be represented while perpetuating a collaborative environment. When asked about some of the formal or informal approaches that he used to talk the faculty through difficult conversations about hiring, Marc shared this strategy:

> With contentious topics, I want to minimize the strong voices that are always trying to dominate the conversation. So, I structure the conversation using what I call "Supreme Court Rules." And I've been telling everybody about this because I think it is fantastic, where the Supreme Court has a rule that when they first discuss a case that they go around the table. Each person gets to state their opinions – before Scalia at the time would interrupt them. What I do is, okay, we're going to go around the table. And everybody gets their say. The very useful effect is that the assistant professors would contribute to the conversation because they wouldn't get talked down. And so I empowered the diversity in the department because diversity represents the bottom end and not the top end of the age distribution. And so that really helped […] But the key point is it empowers the bottom end of the distribution where the diversity lies and stops the resisters in some ways.

The "Supreme Court Rules" have been one of the most successful approaches that Marc has imposed in facilitating a more inclusive climate. He recognized that the diversity in voices (i.e., women and people of color) are mostly represented in the junior faculty ranks and are not always

provided equitable airtime in critical meetings, especially where decisions are made such as faculty hiring. Marc's intentional implementation of the "Supreme Court Rules" exemplifies the collaborative approach that he, as the AS chair, has taken in guiding the unit through challenging decisions, such as recruitment and hiring, while ensuring that an equitable climate is perpetuated in departmental meetings.

Even though there was a deep focus on organizational climate at the core of his diversification efforts, Marc recognized that long-term change requires shared leadership for a unit like AS. In working toward the development of a more inclusive departmental climate as a collaborative approach, Marc has leaned on and credited shared leadership models for some success. He values the power of team building and its impact on motivating change. Marc shared the following regarding the power of shared governance as part of the decision-making process for hires:

> I want to make sure that [the post-doctoral fellows] have support when they come in and so I enforce a super majority rule on whether we're going to hire that person for the [subsequent tenure track] position. And that's a high bar. And we met it, right? And so that shows that everybody values this and wants to have that person there. And I think in the end it will make it easier for them to transition to faculty without any notice of where they came from.

In this example, Marc's enforcement of the super majority vote ensures that all faculty have a voice in the hiring process, and they are all equally invested in the prospective faculty member. This is a critical component that Marc intentionally integrates to ensure a sense of unity and collaboration in all aspects of their work. Moreover, this reflection illuminates how, even in a process that may become extremely administrative – since the hiring of the post-doctoral fellows

essentially takes place at the provost level – Marc ensured that all of the faculty felt a sense of collectivism, so they could invest more broadly in the forthcoming fellows and in diversity efforts.

In addition to creating buy-in amongst the faculty, Marc also reflected on the ground that was softened by leaders before him to allow for change: "But we didn't get here just by me, there were other contributions before me that led to this being a receptive, a place, where you just had to light the spark and off it goes." Jim concurred: "There are a core group of people who consider [diversity] an important topic to stay educated on, and to be aware of, best practices and teaching and hiring and mentoring and recruiting and all that." In these reflections, Marc and Jim spoke to the value of recognizing the collective efforts that have contributed to the department's overall success in diversifying the faculty over the years. This sense of shared leadership around the diversity efforts speaks directly to the collaborative values that Marc works intentionally to instill. Furthermore, this collaborative approach of shared recognition is contributing to the AS success in recruiting and hiring more women faculty (in particular).

Competition: Forcing participation. Like all organizations, AS contends with the tensions between approaches aimed at long-term change and fast change. Often, both approaches are needed. Contextually, it is easy to understand how the AS chair's approaches are collaborative, but there is evidence that Marc does not miss a competitive opportunity when presented with it. Even though he has worked diligently to motivate the faculty to invest in diversification efforts, he has also recognized that this approach was needed at times:

> I've been forcing us to participate regardless of what [the resisters] say. And there may be some opportunity-cost that would be born down the road for that and they can kick me out of this job and it'll be all right.

It is evident that Marc has been willing to be intentionally forceful (as a characterized value of the compete quadrant of the CVF) in order to meet the desired goals of the department – hiring more underrepresented faculty. While he recognizes that this may not always be the best solution at all times, he also openly acknowledged that he had to force some resistant faculty through the process and he has come to terms with that. While focusing on more collaborative approaches in mobilizing the faculty toward a more diversified faculty, Marc also recognized the great value in this competitive approach to ensure the overall success in diversifying the faculty. Marc fully embraced the power and challenges associated with forcing participation as a competitive approach.

Magnitude of Change: Working Toward Routinization

In light of its tainted attrition history with women faculty, AS strategically turned its focus internally toward retention efforts and creating a more inclusive environment for all faculty, as discussed previously. In guiding the unit in this direction, the chair recognized the intentionality that was required for such deep change. Marc spoke passionately about many of these approaches as he worked toward routinizing as many of the AS internal processes as he could, especially around faculty hiring, in order to develop consistency regarding diversity-related issues.

Routines: Formalizing diversity as a foundation and expectation. Marc, as the intentional leader that he was, acknowledged the power of incremental changes that eventually amount to long-lasting change. He understood that all processes and all decisions must begin to change in order to create the larger compositional change he aspired to.

One of the strategies that Marc imposed in creating routines around diversity was the establishment of a diversity equity and inclusion committee. He proudly shared the strategy for the committee:

> So we formed a diversity equity inclusion committee. I empowered two professors, you know, one junior, one senior. The junior is generally a woman. And I would try to make the chair the male so that didn't fall on the junior representative of diversity in the department, but you can't always do that. The committee would meet – and we have non-gender restrooms now. We have the stickers […] We have t-shirts […] And I changed the—um, in science, there's a culture of aggressive questioning which I personally feel is something that drives younger people, any gender, and women and underrepresented minorities in particular out of the field--so I changed it so that questions in the colloquium are only at the end of the talk. You can ask a clarification question but it stops the sort of aggressive questions. That I think was important.

The function of the diversity equity and inclusion committee that Marc spoke about is a routine. Once the committee members are assigned, they have strict directives on the areas they are to focus on, the members does not change within that given service cycle, and they serve within the academic year parameters. These are all aspects that align with the perfromative aspects of routines (Feldman & Pentland, 2003). By establishing this ongoing committee strictly devoted to diversity, equity, and inclusion issues, Marc not only created a routine around the expectation and functions relating to diversity but also empowered other faculty leaders to develop a foundation of diversity expectations for the department.

More specifically, when reflecting on the faculty recruitment and hiring process, all of the participants spoke congruously to the new direction that they were moving in. Since AS has not been offered an open faculty line in several years, yet the department is seeing the benefits it has reaped from the postdoctoral opportunities, it has begun to create routines around the postdoctoral offers. The goal was to mirror the open search process as much as possible, with thorough routines now embedded, for any post-doctoral opportunity the department was involved with. With the tensions that were heating up in AS due to the fact that the only growth was transpiring through post-doctoral opportunities, Marc sought an approach that could help his colleagues feel more at ease. Several of the faculty spoke to trying to regain departmental control in an effort to help them meet their scholarly needs. Tracy, a junior faculty member with growing leadership responsibilities within AS, shared a brief insight into the new direction for post-doctoral hires: "[…] they are actually treating the next round of ILFP and MTFPs as a faculty hire." Stella confirmed: "ILFP is STEM specifically and in its default form, a 1-year post-doc and then maybe faculty position […] astronomical sciences is the only department where it's been a post-doc position definitely followed by faculty." In an effort to provide further detail on how and why AS is moving to routinize the postdoctoral hiring process, Marc shared:

> What I'm trying to do better is I'm trying to make the special hires more like an open hire. And so instead of having two or three people that apply, maybe we can get 40 or 50 and then we can have a short list. We can have a discussion about the short list. We can invite them in, interview them. And as long as we're open and above board of what we're doing, it should be okay. Then we will isolate our candidate; put them forth for the ILFP. They will be competitive because we have vetted them. So that's where I'm headed now.

Because of the tension that Marc spoke to regarding the lack of open lines and the possible impact from successful ILFP and MTFP placements in the department, he optimized what was viewed as serendipitous opportunities (i.e., ILFP, MTFP) and is working to create a stronger, more competitive pool of diverse applicants and to mirror the open hire process for these fellowships. He very clearly outlined the repetitive steps that the department is working to implement in developing a mirror hiring process for post-doctoral fellows to tenure track faculty applicants. Marc highlights the approach to recruit more applicants, to review the applications in creating a "short list," interview the applicants, and vet them in preparation for hiring. Inclusive, the strict parameters around the repetitive action of automatically offering a tenure track position upon the post-doctoral fellowship offer exemplifies the performative routine that AS was engaged in. Overall, the strict repetitive processes (both elaborate and brief) are performative routines. Through the development of these routines, Marc allowed the faculty to take control of the process and reframe the post-doctoral hire as an opportunity rather than a threat. In this situation, Marc's approach of establishing routines has allowed the faculty to buy into the post-doctoral programs that are significantly increasing their diversity.

Furthermore, Jim posited that their unique offer with the fellowship provided them a competitive edge in the hiring process:

> One other thing we do in the ILFP for instance and some of these [post-docs] – you know we've also been very strong at accepting people on the tenure track right away as opposed to this trial period. From what I understand most departments don't do that. But for whatever reason, we do it every time because we kind of feel […more] competitive […] The people we're getting are good; they're not going to – you know they're not

> going to come [without a competitive offer]. Or, they just leave; this way at least they might stay so it's competitive.

Behind the decision to routinize the transition of the ILFPs to faculty from the start is Marc's intention to both increase diversity amongst the faculty and to enhance retention efforts. Jim's reflection spoke to the success that this unique routine has created for AS in recruiting and hiring more underrepresented faculty over the years. Through Marc's intentional analysis and vision for the department, he moved to ensure that a faculty line was always a part of the ILFP offer. In this decision, he also further solidified the AS expectations around diversity.

The postdoctoral opportunities are not the only processes that become routinized while focusing on diversity. Tracy spoke to the strategy that CEDE recommended in their recruitment and hiring training regarding the value of broadening job posting language in developing a more diverse applicant pool:

> It's in the literature, right? A man would apply for a job even if they're not qualified. But a woman would only apply for a job if it is 100% – you know. And I think that would be the only component that would play a part […] When I was hiring post-docs, the advice I got was to frame the ad as broad as possible and use language not like "programming in c-plus-plus is required." Say something, "Programming in C-Plus-Plus is a plus." Or, something like that – advantageous – soften it a little bit or say something equivalent so it is reaching more people even if it is not a 100%.

Tracy's example reflects the repetitive broadened language that is to be included in all faculty-related job postings. The inclusion of a broadened framing for the job posting became the regular

expectation and repeated practice (i.e., performative routine) that all faculty followed, whether it be for a search they were chairing or a post-doctoral fellow they were hoping to hire, as was the case in Tracy's reflection. In this example, she spoke to the routine of broad postings based on CEDE's recommendations, and the expectation that Marc had intentionally worked to enact, that diversity-enhancing strategies are expected to be incorporated throughout all processes involving faculty hiring. This focus on approaches to optimize diverse faculty recruitment and hiring has led AS toward routinizing processes that could impact the composition of the faculty. Marc understood the power of incremental change through the implementation of intentional routines, thus leveraging his position to create these significant changes wherever he saw possible.

Non-Routines: Never pass up a unique opportunity. Although his focus was on intention and consistency, Marc (and previous chairs) has empowered the faculty with agency to create and take opportunities that will benefit the department. Units often feel as though their "hands are tied," as discussed in Chapter I; however, AS faculty are proud, empowered leaders in creating out-of-the-box opportunities. Tracy shared the unique circumstances created when she was hired:

> And unrelated [to a fellowship search], I was invited to give a colloquium here and I came here and met with people. I was talking with people and it was a lot of fun. And then I didn't get any of those fellowships. But I contacted one of the professors here who had a faculty position opened. In fact, he had a post-doc position open. "Would you hire me? Would you consider me?" He said, "Oh, yeah." We really had a good conversation when I was visiting and he said, "Yes, you'd make the short list." He interviewed me for the job and decided to hire me as a post-doc. But knowing that it was my long-term goal to stay here as my forever home, they were able to hire me on a position of a research

> scientist, which is more open-ended. He would pay me as a post-doc for the first couple years and then it was up to me to come up with the money.

It was this creative solution that opened the door for Tracy to apply for a tenure-track position, and to transition into the AS faculty. Had this person who is now a colleague of hers not felt empowered to create a unique opportunity, Tracy might never have joined the department. Tracy's reflection showed how the faculty have been empowered to develop opportunities where they otherwise may not be available. Specifically in this example, the faculty member that moved to quickly interview, creatively develop a position, and hire her into the most stable opportunity he could conceive, is evidence of the innovation that is empowered within AS. While the overall circumstances surrounding this hire still typify a faculty hire, the process by which it occurred was not intentional, non-systematic, and unexpected. Thus, this innovative example is a prime example of an ostensive routine (i.e., non-routine).

Furthermore, although Marc prides himself on the consistent practices that he has developed in AS, he also worked not to miss an opportunity when he saw one. Stella reflects on what she perceived as a rather unexpected offer:

> There was--maybe a couple years ago now, we tried to do a target of opportunity hire for a – she was a post-doc at the time but a Black female astronomical scientist who does really cool science. It's related to mine so I'm really biased. And that was really interesting because that was sort of the chair just deciding, realizing, that maybe we could convince the college to give us a target of opportunity hire. And sort of deciding that the department should try for it and him doing some seeing if it would work and then we did have this opportunity.

This target of opportunity hire did not result in a fruitful hire for AS, yet it spoke to the non-routine approaches that the chair was willing to take when the right opportunity presents itself. It was evident that an open position did not exist, yet the department had invited this talented scientist to come speak, and Marc leapt at the opportunity to make a job offer on-the-spot. In doing so, while the overall outcome would have been construed as a hire (which is a routine in itself), the process by which this offer was made and the conditions under which the position was imagined were serendipitous at best. The creativity exhibited within the hiring practices allows this approach to be classified as an ostensive routine. Overall, while most of the focus was on intention and creating stronger (performative) routines around all hiring opportunities, Marc did also openly engage in non-routinized (ostensive routine) opportunities for the overall benefit of the department.

Summary

To summarize the main approaches that Marc has taken as the chair of AS to motivate the faculty to engage in faculty diversification efforts, we can see three approaches. First, he imparted a broad framing that paired diversity and academic excellence in as many subtle ways as possible. Second, Marc mainly worked intentionally to create a more inclusive organizational climate throughout the department not only as a means to retain current minoritized faculty, while contending with needing to force some participation with some faculty. Third, he worked intently to formalize diversity as a foundation and expectation in the unit by routinizing all faculty hiring-related processes as best as possible, while remaining open to serendipitous

opportunities that would arise (i.e., impromptu post-doc, opportunity hire). Figure 7 provides examples of the characteristics Marc exemplified while valuing opportunities in all 4 quadrants.

Chapter VII: Qualitative Results – The Case for Chemistry

Overview

This chapter highlights the primary approaches taken by the leadership of the chemistry department throughout this case study. Recognizing historical context is critical to understanding the primary approaches that Diana, the chair of the chemistry department, took to motivate change within her unit in order to recruit and hire more women faculty. Furthermore, a few significant characteristics particular to Midwestern's chemistry department are important to note. This unit has existed on the campus since the campus' opening, and indeed is one of the oldest chemistry departments nationally. The department prides itself on being a "pure" field, in contrast to others that are inclusive of applied fields, which tend to draw more minoritized faculty. Finally, openly acknowledging that Diana's representational gender diversity impacted her ability to draw more women applicants to consider faculty positions while she was chair. Many of the chemistry participants in the study noted the importance of having a woman chair, but also recognized that being a woman was not the only, or most significant, marker in recruiting and hiring more women faculty, rather Diana's leadership style in motivating the faculty to join the efforts.

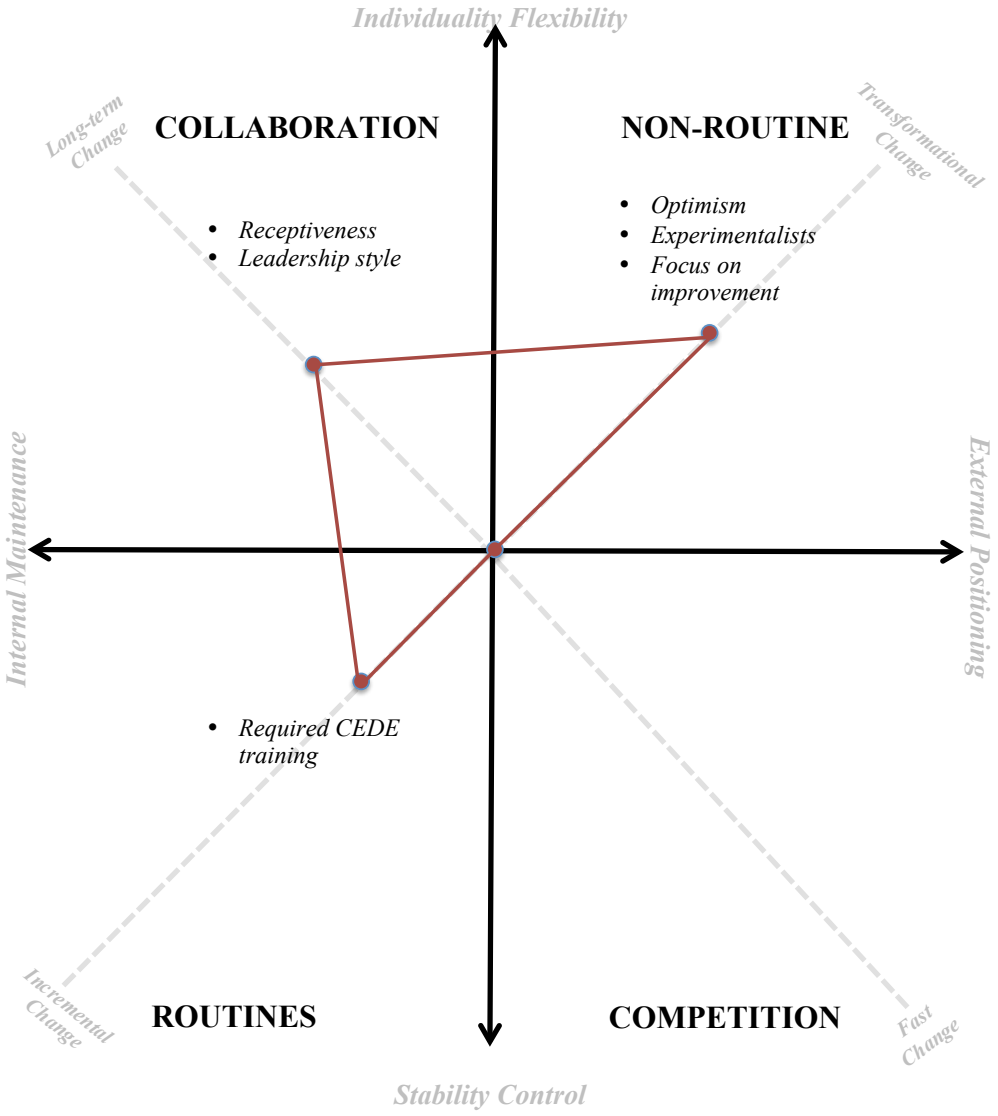


Figure 8. Competing Values Framework for the Faculty Recruitment and Hiring Process Reflecting Leadership Decision-Making in Chemistry

Figure 8 plots the interview emphases in which leadership approaches were integrated in the recruitment and hiring process for faculty. For chemistry, the evidence illustrated in the figure illuminates the approaches taken by the chair in contending with the values set in each of the quadrants. The final 2 sub-sections provide evidence substantiating information plotted in Figure

5: *Speed of Change: Collaboration Is the Name of the Game* and *Magnitude of Change: Towing the Line Between Consistency and Innovation.*

Historical Context: Rising from the Shame

The critical context for chemistry lies in its fraught history of diversity hiring and severe attrition. This shameful history proved to be a pivotal time for the department, and is deeply connected to the rationale for which many faculty and leaders in the unit refer to this time as "the call to change." Prior to Diana's hiring, chemistry did not have a positive reputation for its rankings or for its climate for women faculty. Steve, a long-standing faculty in chemistry, recalled:

> You just can't understand what things are like when you're down […] As an academic department at Midwestern University it is very difficult to understand what it is like to be number 45. It is a head-hanging embarrassment in your professional community. I don't want to generalize that to say that there aren't people who don't understand what is like to be down. Everyone knows what it is like to be down in any given particular situation. But it is an academic community that used to be [sighs][…] It is the faded movie star [laughs] kind of thing […] To the degree that you are Midwestern, how can you be number 45? You're Midwestern; you're better than that. But the place was devastated.

Steve's recollection called attention to the low morale throughout the department, especially regarding its academic ranking. Concurrently, the department was also struggling with a poor cultural reputation from losing several strong female faculty members in a short period. Luke, another long-standing faculty member, recounted the attrition as a major problem when trying to hire more women faculty:

> For this department in particular, there was a problem of hiring good women faculty and then losing them or firing them because they didn't get tenure […] Then the second really big aspect is that we went from being unsuccessful – so for a long time one of the department's biggest problems if you wanted to have women faculty, none applied [laughter]. And, actually, I think the department had a pretty bad reputation. And so we went from a situation where we couldn't even get women to apply, which is a big issue. We have a pool of junior faculty for a hire and it is hard to make an offer to a woman if there are none in the pool.

A collective recognition that the department was low in rankings, and was also struggling with reputational issues around the treatment of women faculty, compounded the poor morale. As Steve characterized it, "Every place from where we were at was looking up, not looking down," an attitude that truly created a window of opportunity for change.

Steve and Luke also clearly acknowledge that hiring Diana, a highly regarded chemist who came in with prestige and rank into the department, was a turning point for the department. Shortly following Diana's hire, she became the chair and began looking critically at the diversity problem. Diana recognized, as Judy (director of DTG) confirmed when referencing Chemistry's DTG proposal, that her approach was to unapologetically own the problem and work intently to address it:

> Chemistry's proposal was amazing. Why? Diana wrote it. Diana also, actually, had the question: Why have so many women been denied tenure in this department? [...] So Diana's idea was: I need to understand what happened.

Diana's forthright approach essentially helped her lead the change effort.

Leadership Framing: An Experiment for Experimentalists

After recognizing that change was imminent, Diana considered approaches she could take to motivate the chemistry faculty to engage in diversification efforts. During an informal conversation, Diana shared that, because many faculty members were still hesitant to try new recruiting and hiring strategies, she had to appeal to their scientific nature to make them feel more comfortable. She framed the change in recruitment and hiring practices as an *experiment*, appealing to their nature as experimenters so that they would be willing to try it. Judy confirmed that Diana's framing was key in turning the unit around:

> Diana was also game to experiment. So not only did she require people to come to CEDE, she also said things like: Let's do a pilot of this idea of open searching, searching without a narrow definition of the position, as a way to diversify the faculty. And if it doesn't work, we won't do it again. We'll just do it for a year. People bought that – lots of doubts, lots of worries; it worked like a charm […] So, I think her willingness to experiment and to kind of – I don't want to say talk the department into experimenting, but offer it in such a way that it was […] It didn't feel like such a high risk.

This experimentalist framing that both Diana and Judy spoke to were key in creating the shift in recruitment and hiring practices within chemistry. However, while the impact was on the routines dictated by the hiring process, the approach that Diana took was creative and innovative in reaching her colleagues. She understood their values as scientists and worked to develop a

framing that would align with that identity. In doing so, she implemented an ostensive routine around the principle of hiring that aligned with chemists as experimentalists.

As such, Judy went on to summarize what she believed created the window of opportunity for change, that "they actually had a pretty high degree of shame about their history which I now know was really important. They had owned their history…" Steve added that they invested in "the notion of being committed to excellence wherever excellence is." This paired with Diana's forthright experimentalist framing created the context and opportunity for their work. She was also able to capitalize on the innovation that spurred from the nature of being experimentalists at heart. This non-routine approach allowed chemistry to leap forward in their efforts toward a more compositionally diverse faculty.

Speed of Change: Collaboration Is the Name of the Game

When Diana began her role as chair, she was very cognizant that her approach with the faculty would be just as important as the strategy itself in changing departmental morale and working toward amends. While one of the major outcomes of the many changes that chemistry implemented was an enhanced ability to recruit, hire, and retain more women faculty, the approaches that Diana focused on were broader in scope and created a deeper impact than the simple numerical increase in women faculty hired. As a well-respected chemist and senior leader in the field, Diana had a strong presence that many recognized, and that she relied on to create two primary collaborative approaches: *capitalizing on watershed moments* and *leveraging of positionality for change*.

Collaboration: Capitalizing on watershed moments. Shortly after Diana's arrival to chemistry (prior to her leadership role), she began to note the lingering tensions from the unit's

daunting history. However, much of what was happening was so invisible that it was difficult to point to the impetus for the problem. Soon after, following a conversation with one of her colleagues, Luke, Diana became privy to hidden problems masked by lack of transparency.

> Luke was on [the promotion and tenure] committee. Luke was in some ways one of the movers and shakers. The department also had really horrible policies so, um, they had secret mentoring committees – secret evaluation committees […] They wrote these reports every year about how they were doing, but you didn't know who was on the committee. So, I remember I was here and Luke and… another faculty member – they just got promoted. They came into my office and said, "Would you support our proposal to get rid of the secret committees." I said, "What do you mean secret committees? What secret committees?" So I said yes because I hadn't been there long enough to really understand this. And we also changed how we voted on tenure so we went to the whole department as opposed to an executive committee. I mean we made a lot of changes. Some of it was in line [with] the dean's office [that] was also really concerned with mentoring and about tenure procedures so I can't say we were doing it in isolation. I would say Luke was certainly one of the pushers about changing the policies.

While Diana was not the department chair guiding this change at the time, she recognized how essential this opportunity was for change in policy. She credited her colleagues (Luke and other key faculty) for starting the much needed significant work. It was their collective work to a more transparent and supportive policies that began to shape a more inclusive climate. The shift in policies signaled the beginning of a set of collaborative approaches that the leaders in chemistry took to shift the climate. Luke shared his recollections of the changes in policy:

> Anyway so the department completely changed its tenure and promotion policies on the order of 15 years ago to a much more transparent, much more open way that I think is better for anybody. It wasn't designed in a gender specific way but I think a lot of the changes were the ones that helped the women coming through quite a bit. But again it just helped everybody. So I think that helped.

Luke's reflection directly points to the collaborative and inclusive climate that the leadership was working to intentionally develop. This quote in particular notes the beginning of the department's work toward more equitable policies that positively impacted all (i.e., women, men, and non-binary). Shortly after these policy changes were implemented, Diana became chair of the department and worked off of this collaborative momentum to change additional organizational policies and expectations. Her keen sense as a leader allowed her to capitalize on the shift in momentum that had been ignited with this policy change, and press forward to analyze and adjust other critical policies and practices.

While lack of transparency in the promotion and tenure review process was core to the perpetuation of an exclusionary climate, Diana recognized that changing one policy was not going to resolve the larger issue of reputation. At the core of what she recognized as necessary change as she developed the DTG grant was the contribution of several policies in the department to the perpetuation of an exclusive climate. Diana recognized that developing a more inclusive climate, for women in particular, would begin to shift departmental opportunities for recruiting and hiring more women faculty. In alignment with DTG's recommendations and the work she had been doing with CEDE, Diana collaborated on changing internal policies to create a more inclusive climate for women. Luke recalled:

> I was on the committee that she had. And it was interesting; early on in the department when we were trying to deal with some of these things we made gender specific policies. That didn't work out real well for us. It didn't seem to help the people we wanted to help enough, and it generated animosity. And so the department went to putting in policies designed to help groups. Sometimes a particular group -- you know there are some studies that say this group would be helped by X policy. Great, make the policy, make it for everybody. And that's more or less what DTG recommends you do anyway, right? [...] That again is a turning point you can see in the department.

In reflecting upon its current state as one of the most gender-diverse chemistry departments nationally, Diana pointed to the windfall of benefits that came from the collaborative work of reshaping policies:

> We got one of these DTG transformational-- department transformational grants in [the early 2000s]. And using that we went through all of our policies, all of our procedures, and worked on trying to make them more inclusive […] Well, we were really then focusing on gender but it turns out that almost everything you do for gender also makes it a more welcoming place for race.

In these reflections, Diana is crediting the grant that the department received from their on-campus partners in DTG as a pivotal resource in helping the unit revisit and reshaping its policies in creating the larger watershed moment. However, much of the success came from the continued attempts at creating more inclusive policies and a collaborative work environment for all. In these examples, Diana's tone and approach in working toward inclusive policies align with

the collaborative quadrant of the CVF. It was her deep conviction to develop a more equitable and team focused department that led her to engaging in collaborative approaches.

The artifacts and behaviors that current abound in chemistry are a testament to the significant shift in climate. What once was considered an unpleasant, and possibly hostile, climate for women faculty is now much more inclusive. Diana shared some happy examples of this shift:

> I think almost all of our faculty believe that we should have pictures of our family out and so little cues. And at our graduate recruiting weekends frequently people bring their kids, so they'll see kids running around. The male faculty can bring their kids too, but they definitely see that this isn't a place where – you know, people believe you should never have children. And so, I think it is not explicit clues but some of these implicit clues. And I would say that is deliberate by the women faculty because we definitely believe that you ought to be able to be in academia and have a family, whether you're male or female. It is harder to have a family of five […] But it is not – I think if somebody really wanted that it wouldn't be impossible.

The field notes corroborate that every single faculty and leader that participated in this study displayed photos of family, children, and/or close friends in their office. Many even had proudly displayed children's artwork in prominent spaces, such as their office entry walls and spaces near their computer screens. In the aftermath of such a tainted history with diversity, the intentional work that Diana committed to creating a more inclusive climate for women has gained traction throughout the department. The supportive environment that is exemplified by the inclusion of families and young children in and around the workplace signal the effects of collaborative

approaches. Her investment in relationships and collegial environments, as exhibited in the reflections, are emblematic of the collaborative quadrant in the CVF.

Diana was firm in her expectations of an equitable work environment, and recognized and capitalized on the DTG grant to change policies that allowed chemistry to reshape its climate. Judy expanded on the impact that Diana's focus on equitable treatment and the impact it had on shifting the organizational culture:

> So I think that it became a place that was really well known to be good. It was the opposite of their previous reputation. They literally turned around a negative reputation as a place to be as a woman to a positive one. It became a zero tolerance for sexual harassment place, which had been the opposite. There were incidents that were short of what you might now fire a faculty member over but that a line was drawn. You can't stand in the hall and ogle women. That's not okay. And so, no, we're not going to fire you over that but we don't want any more complaints about this. We want you to stop this. If you do it again, we're going to do something about it. It gets people's attention when you do that. And they noticed that that stopped.

The firmness of her stance on zero-tolerance for sexual harassment was a strong signal of Diana's investment in developing the "family-like" environment that is typified in the collaborative quadrant. While the stance is firm, Diana's overall approach was collaborative in nature. Thus without Diana's ability to capitalize collaboratively on the momentum developing over shifting policies, the change in departmental culture would have been stifled.

Another watershed moment came with the hiring of Nicki. She was one of the first hires that Diana secured, and that the unit worked collaboratively to ensure. This search was the first

in which Diana framed her experiment with a new process (based on CEDE recommendations), and worked collaboratively with the faculty to revise protocols and practices. While Diana had a lot of skin in this game (politically), so did the department (psychologically). Here is how Luke spoke of the hire of Nicki, whom he characterized as "arguably the top chemist in her field in her generation":

> Nicki […] she was easily the top candidate in the country her year, of any chemist, any gender. And we – that was a big watershed moment for the department because we went ahead and made her an offer even though it almost seemed hopeless. I think she had offers from five higher ranked departments than us. But we went after it anyway [laughter] and she accepted our offer, which we were obviously really happy about. And the other schools that were higher ranked than us were flabbergasted. But she came because she perceived -- this is what she's told me -- she perceived this changing culture and a culture that was going to allow her to do her science and live her life and be happiest in her career. So, she came. So, Diana coming was a huge watershed moment. Nicki coming was a huge watershed moment for the department.

Luke's comment not only spoke to the high value of Nicki joining the department, and their ability to attract such a high caliber candidate, but spoke to Diana's ability to capitalize on this "watershed moment" and unite the department on the changed recruitment and hiring practices. Nicki's confirmation that she selected the department because of the inclusive culture and perceived ability to be supported in having a more balanced life spoke to the impact that Diana's work on creating a more equitable and inclusive climate had on her decision to accept the offer. Diana then capitalized on this "watershed moment" and mobilized the faculty to continue

implementing the recommendations set forth by DTG and CEDE in creating change. Moreover after Nicki's arrival the gates opened and chemistry began to get more diverse applicant pools, which included more women applicants. These applicants could see that if Nicki was at Midwestern, then it must be a great place to be, a place where women could be successful.

Based on CEDE training and the literature presented, Diana helped faculty understand that the approach used in hiring women faculty is critical to the success of the hire. While many were still not convinced, she invoked her framing to allow this to be part of the experimental process. Judy shared the perspective Diana worked diligently to help faculty understand:

> I think the department learned by being successful. I mean the success came first and then the department was more open to understanding why. So, for example, I remember [being] part of early discussions about how to not offend women candidates by saying, "Oh, we're so excited about hiring you; you're a woman." And we got a lot of pushback. You know, everybody thought that was the thing to do. So, finally Diana and I both said repeatedly, many times, "Try it our way. Try it and see how it goes," because those women know. If you want a woman, there are a lot of women out there; I mean half the human race. So, there is really not a problem finding a woman, but finding a well-qualified chemist--that's actually hard to do. They want to know that you recognize their achievements and their capacities. Once they tried it, they were totally successful. And they hired Nicki, who said, "I didn't go to West Coast University -- which is more highly ranked -- because you didn't do that." And of course, Nicki has turned out to be a star. She wasn't yet a star but they wanted her. And she turned down a higher ranked department just because of that -- at least that's what she said – and that was huge. I

> mean they were really able to hear that. Like, "Okay, apparently Diana and Judy were right."

From this moment forward, the faculty stopped using the previous strategy, and started hiring great scientists that happened to be women (when they were the best candidate). Through Diana's collaborative approach, she guided her faculty colleagues to witness the benefits of trying a new strategy that could be successful. Since she worked to bring them along in the process, and not push or force them through the process, they were much more amenable to the learning that transpired. Through this collaborative approach, Diana was able to motivate her colleagues to continue along the change process. This also opened the door for the faculty to hear Diana's suggestions about changing recruitment and hiring processes, and other practices relating to diversity. Steve's recollection corroborated the ripple effects of this shift:

> You've got to have more than one. It is very clear. The literature is right. That first person becomes the exemplar for everything and the person who carries all the burden and weight of being the representative. And it isn't until you build the variation, the diversity, within that identifiable subpopulation, so that everybody else can learn [laughter], that there isn't just a monotheistic view that comes with that. And it is remarkable how it works. I've seen it work. Then you get to something called a critical mass – whatever that is.

This watershed moment gained Diana the credibility that she needed to transform the faculty recruitment and hiring practices in the unit, and ultimately the culture of the department. However, it is in the continued support that Diana gave to all of her faculty that allowed for that

"first person," as Steve's example refers to, to stay and for the critical mass to amount. It was her investment in creating the "we-ness" that is embodied in the collaborative quadrant that allowed the ripple effects that Steve spoke about to take place.

Collaboration and non-routine: Leveraging of positionality for change. As underscored earlier, Diana was hired as a senior scientist for her positionality in the field and for the power of her leadership style. This power was often noted by other leaders and faculty around her, and drew many to work alongside her. Even prior to her formal leadership role as chair, Diana had a significant presence that allowed her to successfully guide chemistry through a challenging time as the department worked to enhance gender diversity amongst their faculty. Judy reminisced about the early years of Diana's arrival: "I don't know if [the current chair at the time] was that intentional about Diana, but I think he understood […] how powerful her presence could be. And he enabled it to matter even while he was still here and chair. He gave her a lot of authority." Diana clearly took heed of the influence that she had and the authority that she was given by other leaders, and began the much needed work in the department. She did not need formal positionality within the department to begin leading, as the authority she was granted cleared the way for her informal leadership.

Shortly after, Diana took formal leadership over as the chair of the chemistry department. She leveraged this positionality to become a catalyst for change. She took bold steps and made major claims that many of her faculty questioned early on, but her positionality in the field and the department allowed them to listen to her suggestions in a slightly more open manner. Judy shared the impact of Diana's positionality within and outside the department:

> First of all, they really took to heart the CEDE things that we said. Like, you can too hire for excellence and diversity; you don't lower standards. Stop looking at women as women and try[ing] to recruit them as women. You want them as chemists; recruit them as chemists. And of course, Diana knew that in her bones and could be persuasive in a way that of course we can't from outside. So, having this senior respected person with no baggage made a huge difference. She hadn't come up from the ranks. She had no scars from this department. That really helped.

The positionality that Judy referred to in this reflection is what allowed Diana to work so collaboratively with her colleagues. Her formal positonality as chair, and her positionality as a highly respected chemist in the field, created the nudge that some resistant faculty needed to engage in the change that she was leading. In this way, Diana leveraged her positonality to engage in collaborative work across the department in working to hire more women faculty. As such, Diana herself spoke openly about feeling relieved at not having been a member of the unit when the trouble initiated. She felt that it positioned her to point to problems without the bias of prior involvement. Diana relished the reprieve and used it to her advantage in working collaboratively with her colleagues on making significant changes to the recruitment and hiring process.

As Nicki described her: "Diana has really been that leader that's sort of taken the mantle […] and really led the department. She's the leader, I would say, on campus for these sorts of things." It was clear from the beginning that Diana was focused on creating a more equitable culture and helping to resolve the diversity problem with faculty recruitment and hiring. While she was keenly focused, Diana was also astute enough to recognize the power of tactics in

working with her faculty. She had learned that she needed to guide them and create buy-in with change processes in order to succeed. One of the ways in which Diana would guide her faculty was by example. As Judy recalled, Diana's positionality ensured that her actions were always noted; thus, she could leverage her position to encourage others:

> So, I think [Diana] …put a lot of energy and time and effort into [a STEM faculty-of-color recruitment] program because I think she felt, "I'm not sure I know how to do this, so I want to figure it out by trying to do it." And I think she learned a ton from just doing -- You were talking at some point in the beginning about their receptiveness and the kind of risk-taking they do. I think that is characteristic of Diana as well as of people in the department. And maybe those are very closely connected; you know if you see your chair doing that you're more likely to [take a risk].

Diana's willingness to jump in and work on the efforts with her colleagues allowed her positonality to shine, and others to follow her example. Judy's example exhibits Diana's collaborative leadership style in facilitating and engaging the change, not simply leading it. The impact of Diana's collaborative approach was not simply in subtle actions, but also in her formal leadership style. As Judy astutely pointed out:

> Diana's leadership style also is crucial here. She is one who believes strongly in a collaborative leadership style so she really wants to hear why you don't think she is right. What is it you think? Do you doubt that analysis of the tenure cases? She's very open to listening to objections and disagreements even though she is in the end moves towards what she is going to move toward. [Laughter] It isn't fake. She really believes the department functions as a unit, and it has to. Everybody has to actually understand

> everyone else's point of view even if we can't operate out of every separate point of view. We have to move forward. I think that many more people got with the program than would under other leadership styles.

For the context within which chemistry operated, Diana's natural collaborative leadership style, as defined by Judy, allowed resisters and supporters of diversity efforts to feel heard and included in the decision-making processes. This inclusive style allowed Diana, as a leader, to mobilize her faculty.

Since Judy worked so closely with Diana on so many of the faculty search processes (which often intertwined with faculty climate issues), she had many opportunities to observe Diana's leadership style, faculty receptivity, and overall impact. Although Judy's vantage point was unique as a collaborator with the department but not as a member of the department, it is also important to note that Judy was a long-time Midwestern faculty member prior to her role as director of DTG, so she was able to critically assess different leadership styles in various departments.

With the chemistry faculty crediting Diana for her leadership and pointing to DTG for the impact they have had in helping the department progress toward a more inclusive climate, it was critical to ask Judy about any uniqueness in chemistry's implementation strategies. Since all of the units at Midwestern have access to services through DTG, it was important to understand how chemistry capitalized on these mutual resources. Judy highlighted a critical insight that only Diana was responsible, through her collaborative leadership, and not through DTG or CEDE:

> So, I think it was very important – and this was really Diana's doing and not ours. It was showing them that it was contingent on a particular pattern and it wasn't, it didn't foretell

> the future. If they behaved differently in who they hired, it would go differently. And that was liberating. I think it made them more optimistic. I really believe optimism is crucial here. If you don't think it is ever going to work, why would you try? You know there's no point. So, I think they kind of talked themselves into a view that it was impossible. And they had to be talked [to] about that so that was another challenge – their sense of hopelessness.

This optimism that Diana fostered in her faculty is where this approach blends into the non-routine quadrant of the CVF. In Judy's reflection, Diana leverages the optimism and hopefulness that the faculty are feeling following successful hires. Thus, she leans into this optimism as a creative approach to reignite another successful search process. While the optimism is a creative approach to recruitment and hiring, Diana also refers to the contingencies of the pattern (refrring to the hiring process). Thus she leverages the optimism as an innovative tool to motivate continued change.

This instance underscores Diana's consistent and diligent nature as a leader in ensuring that her faculty were well-informed and felt connected to the work on diversity. Her commitment to this collaborative work allowed the department to begin to feel optimistic in the face of poor morale. This optimism is a non-routine approach that Diana was able to capitalize on. With the creativity that underlies optimism, Diana chose to capitalize on her positionality (formal, informal, or in the field) to guide her unit collaboratively and non-routinely toward positive deviance.

In Figure 5 that illustrates approaches that chemistry's chair implemented to guide the unit toward successful strategies in hiring more women faculty, it is significant to note that all of

the strategies are plotted in the *collaborate* and *non-routine* quadrants, signifying that the leader own individual flexibility in managing both types of approaches.

Magnitude of Change: Towing the Line Between Consistency and Innovation

Recognizing its troubled history, the chemistry department knew that each step forward needed to be intentional and strategic. Judy commented, in retrospect: "[T]hey actually had a pretty high degree of shame about their history which I now know was really important. They had owned their history by the time [the previous department leader] was chair." This reflection underscores much of why Diana approached recruitment and hiring only through routines, and left no situation to chance.

Routines and Non-Routines: Rising from the Ashes. Recognizing the need for the consistency of established routines, Diana also relied on routines that predated her arrival. In fact, one of the most prominent routines predated Steve's arrival by a few years. It was a cognizant effort on behalf of the chemistry chair (during the era of Steve's arrival) and of the dean of the School of Arts and Science (SAS) as they strategized together to improve the retention of the faculty within the department. They had already been experiencing trouble with retention and their rankings were a "head hanging" shame, as Steve referred to it. Steve openly shared his perspective regarding the tone that the leadership took within the first few years that these new faculty joined the department, as leadership worked consistently to deliver the same message in developing a core:

> So, the commitment: "I'm just saying that because [of] the level of commitment in what had gone on in the previous 15 years, we understand that the 5 of you or 6 of you [new faculty] that we have hired over this 3-year period, you are going to be tempted. Before

> you even – before that odor [laughter] even wafts in your direction, let us know. Our commitment is to have you here in 10 years, in 20 years, and so forth." So that's really – Those [faculty] grew up with that as the overt message from both the college and the department. And in retrospect, there is a [wing] and a prayer in doing that because you're really trying to create the social bond between those people, because this is not going to change overnight… So I think -- I know that was intentional. I one-hundred-percent know that was intentional. And of that group of people that was hired during that period, only one left. And it was years and years later as a career change. And of that subset of people, all are still here and I will say are among the […] some of the biggest "we are Midwestern rah-rah enthusiasts" we have. It really affected them.

The performative routine in Steve's reflection is in the repetitive practice that the administration and departmental leadership practices in ensuring that these newly hired faculty understood that they were wanted, that they belonged on campus, and that the university and department were invested in their longevity. It is evident in Steve's comment that a version of recruitment persisted with these faculty to ensure that they stayed for decades. In many ways, this version of performed recruitment bleeds into forms of retention. Thus the dean and the chair worked tirelessly to spread this message and to ensure that this core of faculty knew that the college and department were invested in them. The benefit for Diana was that she was able to engage these enthusiasts in advancing the work on diversifying the faculty. Luke and Steve were both part of this core, and have been deeply committed to these efforts and to supporting Diana in her leadership approaches. Diana also continues to invest in new faculty and help them feel supported and wanted in the department.

However, in working toward change, all efforts were focused on improvement, which is firmly planted in the non-routine quadrant as a creative outlook for change. These improvements included academic improvement, pedagogical improvement, and social improvement, which indicate a willingness to be cautiously flexible in moving away from routines for the benefit of change. Steve's reflection pointed to a collective investment in improvement.

> You know we weren't a top-30 department [laughter]. We had a lot of flexibility at that point because every place from where we were at was looking up, not looking down. […] I think it creates an environment where people are more amenable to change because the only direction they think they can go is up [sighs], in research, in teaching, and in all of the socially relevant aspects of being an academic unit. I think that we just ended up being on the leading edge of a really good time because there was just no place to go but up.

While continuing to reflect on their tainted history and their path toward greater success, Steve truly focuses on the concept of improvement. This sense of hope based in improvement was pervasive, as evidenced in his reflection. In working toward change, especially toward a more equitable climate, which in turn allowed them to successfully hire more women faculty, chemistry's leadership focus on perpetual improvement was an ostensive routine (i.e., non-routine quadrant value) that blurred the lines of traditional routines and allowed them to be innovative in making changes where they saw necessary, including research, pedagogy, and organizational climate.

Diana routinely worked from this perspective of improvement and embedded that in routinized processes throughout, especially around recruitment, hiring, and retention of faculty.

In this vein of working consistently to improve a tainted history, Nicki provided a reflection regarding her alignment with DTGs findings and chemistry's success in hiring more women faculty:

> I think one of the things Judy found is [that] the department has sort of adopted very progressive policies in terms of race and gender -- sort of in hiring […] There was sort of some guilt that they were feeling about how things had been in the past and really having a motivation to fix that […] But that's one of the components that made that take hold. There were a group of people who felt really badly about what happened previously. And I guess a strong leader is the other thing. Diana has really been that leader that's sort of taken the mantle of this and really led the department.

Diana's pervasive reminder to improve – and rid themselves of guilt by "rising from the ashes" of its fallen history – allowed the department to learn from their past, and make significant strides into a successful future that included hiring (and retaining) more women faculty.

Routines: Practices grounded in expertise. One of the largest challenges in finding a path forward toward positive change was recognizing where the areas of weakness were. After Diana identified the weaknesses within the department and a goal of investigating the reasons for this poor climate, she also realized that neither she nor others in her department were experts in faculty diversification. They all were experts in chemistry, of course; however, the problem they were aiming to resolve was not in chemistry, thus leaving them with a weakness. Diana immediately partnered with DTG, as she honored their expertise in this work, and recalled this as an empowering moment as she began leaning on the experts in faculty diversification:

> Being part of the DTG grant and having that support at the highest level really made it a lot easier to do as chair. It is pretty clear to me I wouldn't have done it without the DTG grant […] Reading that literature – well, first of all I learned an enormous amount--but it also gave me the confidence to be able to talk and say, "No-no, you're wrong. This paper says such and such." As soon as I list that I'm quoting a paper, that's it; I won every argument [laughter] so a little bit of knowledge can go a long way.

This new knowledge base and artillery to work in chemistry with non-experts in diversity gave her more confidence in the information that she was learning through DTG and CEDE. She recognized that if she presented her case and substantiated it with research, her science colleagues would buy in much easier. Thus, she created a routine of relying on the experts at DTG to help her fill the gaps. In this reflection, it was evident that Diana created a trusted and repeated pattern of inquiring with DTG on a topic regarding diversity and hiring, reading the new information, acquiring the knowledge, sharing the new knowledge, and leveraging it as an empirical tool to convince her colleagues of the work that needed to transpire. These repeated patterns, with the same members of DTG and chemistry, and repeated patterns of response, naturally qualifies this as a performative routine.

Diana not only created a personal routine to rely on the experts, but she instilled the same sense of confidence in DTG in her faculty colleagues, thus perpetuating that routine of trust in the literature, and of reliance on DTG's expertise. An exchange with Judy regarding one of the DTG resources that several of the faculty spoke about, *Whistling Vivaldi*, reaffirmed this notion that the faculty developed patterns for taking in the new knowledge that the DTG experts shared.

Judy spoke to the faculty's willingness to see their expertise limitations and seek resources from topic experts:

> I think perhaps the success with gender helps them think that way. They weren't successful [at first]; they didn't know how to do it and they figured it out. But they had tools when they figured it out. Okay, those tools aren't going to solve this problem yet so they need more tools -- and they do. But they're going after them which is really cool.

It was repeated in every interview that whenever there was lack of clarity or new solutions to a problem would be presented; chemistry would turn to DTG for guidance. This repeated practice of turning to the experts for guidance has been a key to chemistry's success.

In a couple of more processes (i.e., search committee training and recruitment language), Diana worked with her faculty to embed the recommendations of DTG and CEDE. Their expertise was directly inculcated into the faculty recruitment and hiring process. Although all of Midwestern's search committees are now strongly encouraged--and all of SAS' search committees are required--to attend CEDE training on understanding the ways in which personal bias impacts the search process, Diana required that all of chemistry's search committees attend CEDE training prior to the beginning of any recruitment and hiring process. This was a mandate that she instilled because she valued the expertise and knowledge that CEDE was disseminating in helping to create more equitable hiring processes. As Judy commented, Diana was a pioneer in requiring this routine:

> So, Diana was a founding member of CEDE. So, the first group of faculty on CEDE was all like Diana. Interested in equity, aware that there was no equity in STEM for women but also really didn't know much about the literature or about exactly how bad is it.

> [Laughter] – You know I mean they sort of had a general idea but they didn't really have any detail. They were all scientists who knew their science. They were distinguished senior scientists; that's why we picked them […] I would say … one big piece of the partnership was […] to really taking on board this social science understanding of how implicit bias works, how organizations reproduce bad outcomes unintentionally […] understanding things won't change unless you do something different […] So I think [CEDE] gave analytical tools that were helpful to her. And she brought those tools into the department. She required that search committee members take the CEDE training before SAS did. And in fact [laughs] […] the dean required everybody to do that, because he said to me, "If Diana can require it, what's wrong with me?"

In Judy's reflection, not only is the performance routine reinforced of Diana seeking resources from content experts in DTG and CEDE, then implementing that new knowledge in chemistry; she also creates a new requirement of all faculty serving on search committees. These committee members were required to attend CEDE training on understanding unconscious bias in the search process, and strategies for developing a more diverse applicant pool, prior to serving on the committee. Thus Diana implemented in a routine requirement for all search committee members to attend the CEDE training as a precursor step to serving on the search committee.

Concurrently, as she introduced changes to the recruitment and hiring process, Diana leaned further on the experts' guidance and began to convince her colleague of the new language that should be experimented with in the recruitment and hiring process. As Nicki recalled from her own hiring process:

> I mean [other departments] do want to hire women, but they're doing it all wrong. You don't want to be told that – when you're applying for a job – that that's what they really want to hire. You want to hear, "You're a great chemist. We think you fit great in our department." And I think we've been able to do a really good job of moving in the other direction, and I think that's been really great. I would say Diana is a big part of that.

This was precisely the language that DTG tried to infuse throughout all of the STEM areas in an effort to help them reshape their recruitment strategies. Diana's push to routinely integrate this language, as we saw previously, had great results in the successful hire of Nicki. Thus, following this experience, the department routinized this language into the recruitment and hiring process and continued to have great success in hiring more women faculty. In all of these examples, Diana guided the department toward developing routines around expert knowledge and advice. By trusting this expertise and creating routines around it, chemistry witnessed a change in hiring outcomes.

Summary

For the chemistry department, the evidence points to five main approaches that the department chair took to motivate the faculty to engage in faculty diversification efforts. Many of these approaches stemmed directly from a reflection on their tainted history, characterized by poor rankings and a poor departmental climate for women. The approaches that Diana championed were: an experimentalist framing, capitalizing on watershed moments, leveraging her positionality for change, routinely rising from the ashes, and implementing routines that were grounded in expertise. Collectively, these approaches aided Diana in motivating her faculty to

engage in the necessary change to recruit, hire, and retain more women faculty. Moreover, her leadership approaches position chemistry as a unique case in balancing behaviors and choices amongst all 4 quadrants of the CVF (see Figure 8 for details).

Chapter VIII: Qualitative Results – The Case for Environmental Sciences

Overview

This chapter will present the case study findings for environmental sciences (ES). ES at Midwestern tout uniqueness as an organizational leader in faculty diversification efforts at Midwestern, especially in light of its brief history as an independent department. Understanding ES' historical context is critical to analyzing how Rian, the current chair, and Esther, the previous chair, motivated their department to engage in efforts requiring changes to long-standing faculty recruitment and hiring practices. While certain fields currently housed in ES have deep roots dating back to the mid-19th century, the recent departmental split provided a new window of opportunity for change. Furthermore, ES is in one of its earliest transitions of chairs/leaders, leaving room for new influence and some moments that may be perceived as unstable. The following section provides a historical background for ES, which positioned leaders to motivate their colleagues to change their faculty diversification strategies through a framing grounded in their disciplinary norms. The leaders have taken 7 approaches in motivating their faculty colleagues toward change, including: *leadership framing that aligns disciplinary norms with social justice, fostering formal and informal collaborations, supporting and acknowledging diversity workers, retaining the competitive edge, leveraging positionality for change, intentionally developing the pathway,* and *empowering faculty as opportunity agents.* Furthermore, as Figure 9 illustrates, the ES leadership approaches have been categorized as

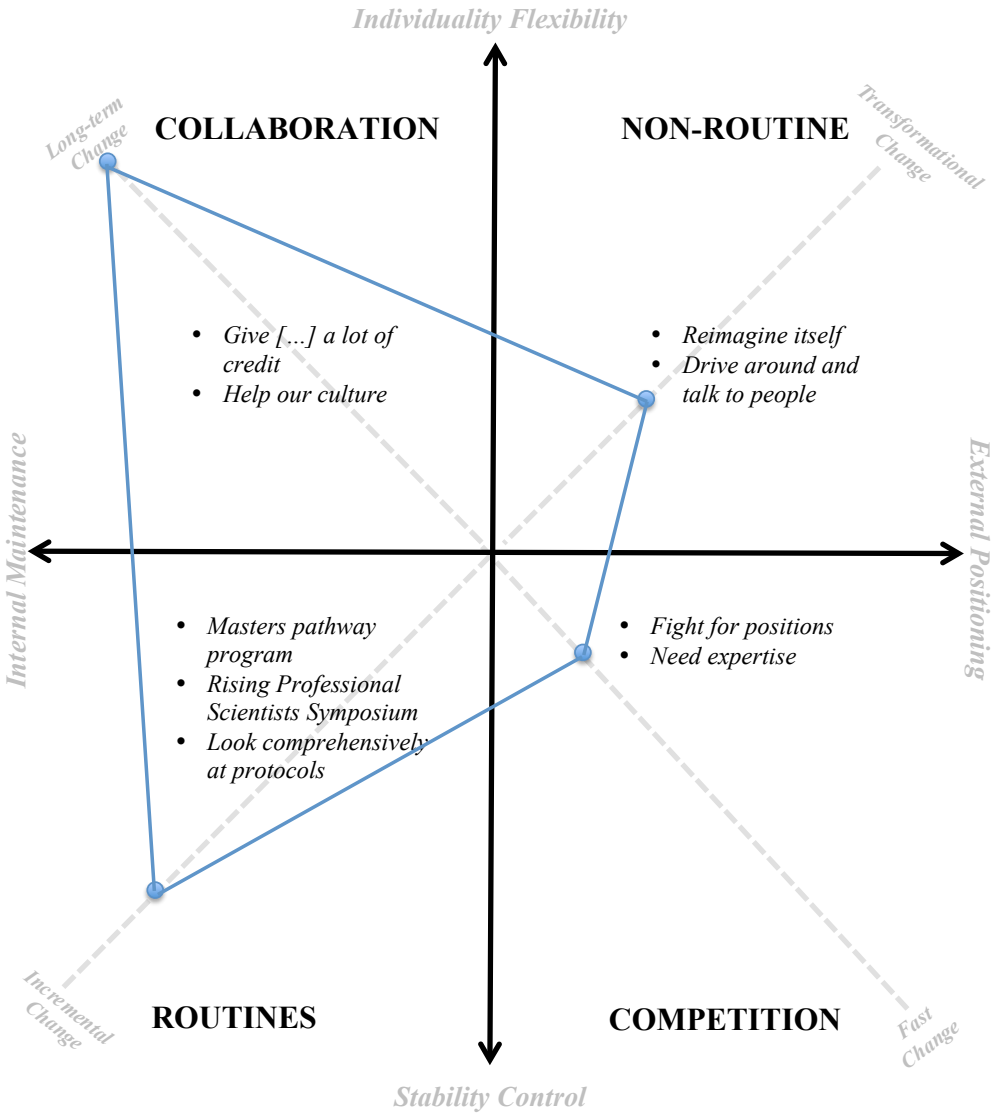


Figure 9. Competing Values Framework for the Faculty Recruitment and Hiring Process Reflecting Leadership Decision-Making in Environmental Sciences

primarily collaborative and routine, with some flexibility for non-routine and competitive approaches as may be beneficial to the department. The final 2 sub-sections will elaborate on the evidence to substantiate the plotted incidents in Figure 9: *Speed of Change: Approaching Change through Collaborations* and *Magnitude of Change: Intentionality and Routines for the Win.*

Historical Context: Reimagined from the Beginning

As noted previously, ES is a relatively young department. However, most of its programs date back to a larger biology department. As the leaders and faculty have pointed out, the birth of the ES – in its independence from biology – was foundational to how they currently function. In many ways, ES reimagined itself during this time, and was able to instill new values and practices that were previously resisted in biology. Rian distinctly commented about this: "Keep in mind that we are a relatively young department. We were founded in [early 2000s] […] I think the culture – In setting up a new department you have an opportunity to reshape things." Although the split from biology was not the only impetus for the shift in values, it was clear to the faculty and department leaders in ES that the leadership of Esther – the first chair of the department who was deeply committed to diversity – significantly shaped the direction of their commitment to diversity issues. From the faculty perspective, the biology department had shared very traditional values and beliefs around diversity in previous decades, therefore requiring the transformation that Esther brought to the new department. When asked about the current state of diversity in the department, Jeff, a longtime ES faculty member began by comparing it to that of previous times:

> It hasn't always been environmental sciences. When I first got here it was the Department of Biology. And when I first got here there was only female faculty member. Of course, no African American faculty members, as far as I recall, no Latino or Latina faculty either – the only woman faculty happened to have been a wife of one of the other faculty members which some have suggested was the reason in those days that she was actually on the faculty, although, she was a perfectly fine professor, there was no question about that, but it was very unusual in biology to have female faculty members at

> the professional level – at the tenure-track professional level. I got here as a faculty member in [the early 70s] […] I immediately started talking about the issue of diversity, both racial and ethnic diversity, and gender diversity. I got absolutely nowhere – really basically got laughed out of the room. My very first year here I proposed that the department establish a diversity committee and basically people literally laughed me out of the room. Somebody suggested that I was some kind of Soviet spy or agent […] And then it just so happened that that was at the time when the Black action movement – the first Black action movement got started at Midwestern University. A bunch of African American students, they petitioned the university to do something and it was actually a really good movement. And I think that more than anything else kind of changed the receptivity of the department. It didn't change any actions, but I think it changed the receptivity of the department to racial or ethnic and gender issues associated with the department […] And I think that the main jump that we had was when the department itself got established as opposed to just a biology department now […] at that point there were several key faculty members – me being one of them, but also very importantly Esther and [the chair at the time]. And the three of us were very highly committed to the diversity issues.

Jeff's insight provides perspective on when and how the shifts in the department began. He pointed to the Black action movement as the impetus for softening the ground on diversity issues, but it was not until the establishment of ES as an independent department that the true shift took place.

Furthermore, that significant shift came with very intentional shared leadership – both formal and informal– and the establishment of core committees. While the university's current strategic diversity efforts require a diversity committee per unit, Rian proudly shared that ES' diversity committee has a much longer history, stemming back to the beginning of the establishment of the department. He elaborated:

> So we have a diversity committee. I believe it was critically important. We've had a diversity committee for a long time, and that gave us an agency, right, like an awareness where you have a specific committee to deal with this. So when issues come up they can defer to the diversity committee.

The diversity committee that Jeff had long asked for in biology was finally established through Esther's leadership of ES. As had been envisioned, the role of this committee served multiple roles, key among them the act of establishing a core organizational investment in diversity. Rian reflected on their success in working toward a diversified faculty: "I think the composition of the chair, the establishment of a diversity committee – a proactive diversity committee, the establishment of a bridging program – the master's program – all of those have been really important." Collectively, this intentional history has created the opportunity for action toward positive deviance in hiring more underrepresented faculty.

Leadership Framing: "Naturally, the discipline is very open to social justice"

In light of ES' unique opportunity to reimagine a new direction for its future as a new department, Esther acknowledged the power of framing in helping motivate her colleagues toward change in faculty recruitment and hiring practices. When asked about the framing that she and others leveraged to infuse change for diversity, Esther quickly commented: "I think our

department, ES, has always been very much open to social justice. I think because we're so concerned about environmental issues that that just lends itself to thinking more broadly about social justice issues." She gladly elaborated:

> We think about conservation at the species level, that's kind of an ethical issue, but how does that influence the functioning of ecosystems including all these services that humans rely on? You know, from erosion control to higher productivity to nutrient retention – all these things that are really important things that natural systems do. Are those affected by the diversity of the system if you have a bunch of species versus monocultures? Yeah. They do a lot. They can do a lot of those functions. That became a part of the science as a whole experimental approach, and a whole body of theory that has been developing over the last, say, 20 years. So the value of diversity per se is again embedded in a lot of our thinking […] So again, the arguments make a lot of sense to people.

Esther leveraged this framing throughout to remind resistors that, for environmentalists, diversity is at the core of the work they conduct. Identifying this framing that aligns environmental scientists with social science diversity is a powerful and innovative approach in guiding faculty colleagues toward change. Esther repeatedly infused this framing as she reminded her colleagues of their fundamental values as environmentalists. The innovation in this approach firmly maps this as a non-routine (i.e., ostensive routine) on the CVF. Over time, it became evident that the power of this framing allowed Esther (and other leaders in the department) to move the needle of diversity efforts and especially to create change in their recruitment and hiring approaches.

Speed of Change: Approaching Change through Collaborations

As noted in Chapter II, the CVF provides a lens for understanding the leadership approaches taken in each unit in this study. While the values-based tension along the secondary dimension of speed of change on the CVF indicates tendencies toward collaboration and/or competition, it measures *how* decisions are made (i.e., whether the approach is collaborative or competitive) and can also measure the *type* of approach selected (i.e., whether the approach is a collaboration/partnership or a competition). For ES, the data indicate that the leadership have taken 3 main approaches toward motivating long-term change in recruitment and hiring practices: *fostering formal and informal collaborations for diversity, supporting and acknowledging diversity workers over the years,* and *retaining the competitive edge.* The following sub-sections will delineate the mechanisms by which the leaders have implemented these 3 approaches.

Collaboration: Fostering formal and informal collaborations for diversity. For ES, the faculty credit the leadership's support of formal and informal collaborations. Many of these partnerships that developed around a dire need to increase compositional diversity among graduate students and ultimately among the faculty impacted the work the unit conducted. As we saw in the historical context, the formal development of the diversity committee was instrumental in centralizing diversity work and diversity issues in ES. Rian spoke to the broad impact the diversity committee had, and the ways it continues to shape the culture of the unit:

> We've had a very active diversity committee […] They help our culture because they help us focus on issues and consider new approaches to them and essentially report back

> to the faculty in the department. And that's helped a lot. That mechanism – proactive, long term, and long-living diversity committee – has been a significant factor.

It is evident that without the presence of this formal collaboration within the department the culture around diversity would not be as accepting or inclusive. Thus, Esther's early decision to form this committee continues to have ripple effects on the diversification of faculty today.

ES faculty members are also quite proud of the formal outreach-related collaborations that the leaders have encouraged throughout the years. Jeff talked about one program in particular, in which he had held an instrumental role.

> We had a program, which was actually a joint program with me and [two other faculty members] in the department. We got a grant from NSF to have a special RU program […] Our analysis at that point was that it was a pipeline issue […] And so our strategy was to get students at a younger age, when they were either juniors or seniors in college or maybe even sophomores, and bring them to Midwestern University.

This formal partnership that Jeff was a part of is evidence of the several collaborations that ES hosted as outreach and recruitment programs to diversify their graduate programs. While the cyclical nature of the RU program could be construed as a performative routine (due to the program parameters and annual behaviors), it is in the collaborative work amongst faculty colleagues where the continued work persisted to improve diversity efforts. Once the funding for this program ended, so did the program; however, the collaboration amongst the faculty leads persisted and perpetuated in other diversity-related efforts. Therefore, what may begin as a routine can shift over time into another quadrant, such as collaboration (as in this example).

Over the years, Esther and Rian have invested in both formal and informal collaborations. While the prior two examples are formal collaborations, Esther also recognized the power of informal collaborative approaches in developing diversity work on behalf of the department.

> Jeff has been very influential in all of this [diversity work]. Jeff was one of the original members of CEDE […] and he and I spent a lot of time talking and plotting when I was chair. I think it's been something from the very beginning [of ES as a department], I've been conscious of all of these issues.

The informal collaboration between these like-minded leaders – Esther and Jeff – shaped much of the work that ES engaged in. The informal collaborative work that transpired while their were "talking and plotting" as Esther referred to it, had deep impacts on the direction that ES took in the foundation years. As such, their informal collaboration significantly impacted the value that was placed on diversity and the need to hire more underrepresented faculty.

In particular, with the expertise that both Esther and Jeff gained by being members of CEDE, and with the benefit of ES's DTG grant, their plotting quickly impacted the department's work to increase the compositional diversity of the faculty. Jeff noted the impact that their collaborative work on the influence garnered within the department: "At the time of the [departmental] split, there were really 3 of us who I would say were supported by quite a number of other faculty members and overwhelmingly by the graduate students in the department."
It was informal collaborations, such as this one, that chairs have leveraged to help motivate the faculty to engage in diversity efforts.

Collaboration and non-routine: Supporting and acknowledging diversity workers over the years. Both Esther and Rian have supported and acknowledged the contributions of others within ES in encouraging a more diverse faculty. This collaborative recognition has created a culture of willingness to continue the work. Most recently, Rian has leveraged this approach in commending the work of the collective, knowing that the more faculty support they had, the better the opportunity for success will be.

Throughout various parts of the interview, Rian referred to the many contributions that Esther made in creating a foundation that was grounded in an appreciation of diversity. His commendations of her work were echoed by many of the faculty. Evidence of Esther's contributions to this work abounded, but Kim's comment captured the essence of how Esther's work was perceived:

> I would give Esther a lot of credit […] I know that she was very actively engaged again at the time with DTG, especially as a mechanism of bringing more diverse pools of applicants […] I think raising the conversation, making that conversation more widespread and accessible to some of the concerns and issues and the biases that creep into hiring practices and things that can be done proactively to increase representation in pools.

This is the first example of shared recognition that is leveraged as a collaborative approach by leadership. In developing the "we-ness" that is core to the collaboration quadrant, sharing and acknowledging the contributions of others is critical to the success of diversity efforts.

In all of the interviews, each leader and faculty member mentioned the fact that Esther's commitment to diversity drove the department to also invest. As was highlighted previously,

Rian pointed to Esther's contributions and to those of the past dean of SAS as pivotal in motivating the change in faculty recruitment and hiring practices that are now contributing to success in hiring more women faculty and faculty of color. In a nutshell, he pointed to what he believed most shaped the diversity-minded culture of the department:

> We're in a transition point, especially in the sciences. And this department has had [success changing our culture], I think, partially because […] its founding long-term chair was female: Esther. I think partially because of that, but partially because of the legacy of the previous SAS dean who was a very strong advocate for hiring women in particular but also diversity – I think that's helped shape our culture a bit.

Continuing to recognize these groundbreaking diversity workers (Ahmed, 2012), whether they are in formal leadership positions or not, impacts the sustained success of the department. This collaborative approach that Rian perpetuates contributes to the success that ES experiences in attracting more women faculty and faculty of color.

Both Rian and Esther praised a pair of ES faculty members who began an innovative blog about how to diversify environmentalism. Esther referred to one of them like this: "My colleague […is] one of the people who started the online listserv blog. She's a fabulous scientist, fabulous at outreach efforts. She's a fabulous teacher. [She] is brilliant and totally committed." Rian elaborated on the impact of this outreach innovation:

> This is their idea: online listserv blog area to diversify our discipline, and it's been a runaway smash. Thousands [of] women and members of minorities signed up […] And we shamelessly use that [to recruit]. We reached out to people and […] we actually asked them to apply […] we want you to be part of the pool. We want to check you out. And

> the site isn't exclusively for that, but we've used it that way […] And also the people who sign up, they know that this initiative is coming from this department so I think that helps [our] reputation also.

As an additional example of the power of collaborative recognition, these ES colleagues have felt empowered to develop a new online blog regarding diversity and environmentalism. They continue to be praised by leaders within the department and their field, and are encouraged by the continued recognition of their contributions. This collaborative approach is powerful. Furthermore, while the interaction is characteristic of the collaboration quadrant, the actual online blog – especially as it is leveraged as an outreach tool for future faculty – is a prime example of a non-routine approach. The innovation and creativity that is foundational to this approach firmly maps this approach in non-routine. Likewise, as an innovative approach to recruiting, it is also recognized as part of the ostensive routine of hiring.

While in some organizations, leaders will co-opt the work of others when progress is made toward desired goals, Rian and Esther not only acknowledged these acts of faculty leadership in developing the blog and the significant impact that it had on diversifying applicant pools for faculty positions, but they also continued to support these efforts by touting the contributions of their colleagues. Through this shared leadership approach, Rian and Esther persuaded their colleagues to engage in faculty diversification efforts.

Competition: Retaining the competitive edge. While the focal point for ES leadership has been around collaborative approaches, they have been open to minor competitive approaches in retaining their competitive edge. As a boundary-spanning leader (Chun & Evans, 2015), the chair in ES is viewed as the person who will fight for faculty lines. Therefore, while it is

expected that the chair will have a strong working relationship with the dean, it is also expected that that person will compete for positions when the opportunity arises. Jeff framed it this way: "A position opening – yeah – [requires] – a lot of debate, a lot of pressure on the dean. I mean, it all has to do with whether the dean is going to give us a position or not […] We don't get positions very easily. We have to fight for every single position." Rian is viewed as the person who needs to fight for these positions, in order to open the door of opportunity to increase the compositional diversity of the ES faculty. This aggressive behavior, paired with forceful posturing, in vying for open faculty lines clearly positions this approach in the competition quadrant of the CVF.

Similarly, Rian reflected on the disciplinary expertise that is required of each search committee to ensure that the *best* candidate is selected for the open position. In having the authority to select each committee member, Rian ensured that scientific expertise was at the top of the list in order to retain the competitive edge within the field when hiring. When asked how he selected the search committee chair and members, this was his response: "Well the main thing you need is – depending on how the search is framed – you need expertise. So you need expertise in this topic area. And you also need […] ideally a knowledgeable, authoritative, senior faculty member involved who is experienced." Rian explained that this expertise and senior positionality was critical to ensuring that the committee respected the leader and that this faculty member held control over the way the search process was conducted. In many ways, this reflects a traditional hiring model. Changes to the faculty recruitment and hiring process have otherwise been altered, but this was the approach that allows the department to retain its competitive edge, according to the leadership.

Magnitude of Change: Intentionality and Routines for the Win

With a historical opportunity like the one that ES had to reimagine itself, it is understandable that most changes would be approached in a systematic and incremental fashion. The significant transformational approaches all transpired as the department developed its independence from the biology department, so the foundation of diversity at its core was set. Changes that followed this major shift were approached with intentionality and through routines to ensure stability in the unit despite incremental change. While understanding the power of her position as chair, Esther *leveraged her positionality* to motivate the faculty toward change in the faculty recruitment and hiring practices. Additionally, Esther and Rian continued to support the intentionality that faculty poured into developing outreach programs and routines ensuring diversity for all faculty positions applicant pools. Not only were the faculty and leaders proud of these programs, but they have been widely recognized, by campus, disciplinary, and national peers, for the efficacy of these programs in helping them *develop the pathway* toward more diverse faculty applicant pools.

Routines: Leveraging positionality for change. Considering ES' unique history, Esther recognized the opportunity and the power of the position of chair in creating change. She acknowledged the power of her positionality and leveraged it to motivate her colleagues to engage in faculty diversification efforts. She shared her perspective on the importance of the chair role:

> I think the chair is incredibly important […] I think having a chair that is very clear about the goals doesn't enable bad behavior but is also very individually welcoming and – you know, when I am negotiating with people it was, "This is your chance." I would tell women. Women always don't ask for enough. They always ask for less. "Don't you do

> that. Why aren't you asking for this?" You know having that kind of attitude really helps […] It's huge. And that's what people would tell me, that is part of why they wanted to come.

Esther's reflection on the importance of the chair role highlights one of the primary ways in which she repeatedly leveraged her positionality to encourage more equitable faculty hiring. The intentionality with which she encouraged every woman candidate to bargain for equitable resources became part of her performance routine during faculty hiring processes. Her repeated approach with prospective women faculty, in encouraging them all to ask for equitable pay and resources upon accepting the position, was a mechanism that Esther leveraged to create more equity amongst the faculty in the department and also to encourage more women faculty to accept the position, if offered. It is evident that Esther was quite astute about the positionality she held, while chair of ES, and was not shy to use it to foster equity.

This insight from Esther highlights not only her recognition of the power of her formal positionality (as chair), but also the ways in which she leveraged her personal positionality to help promote equity for women faculty. Esther also explained where her deep commitment to diversity first started:

> [Diversity] has been a goal – certainly one of my goals – from the very beginning […] I had just gotten tenure and I was the only natural scientist to join that feminist theory group. And I went to Seven Sisters College […] So this has all been in my mind for a very long time, and part of what I have always thought about. So being chair was obviously a fabulous opportunity to start doing something.

In learning about Esther's personal history, having attended an all-women's college and having a grounding in feminist theory, it was evident how her personal positionality (as a deep-seated feminist) influenced how she leveraged her formal positionality when she was chair. She allowed her personal positonality to serve as the motivation for the change that she was mobilizing amongst her colleagues in ES. This was the repetitive behavior that Esther would rely on – the performance behavior of leveraging her positionality for diversity.

As is evident, Esther left nothing to chance. She used every opportunity as chair to ensure that diversity was the foundation of the work that the department was engaging in. She ensured that these values were infused in her daily interactions and decisions. The intentionality with which she approached her leadership led the department to the success it has today.

In this leadership transitional stage for ES, Rian reflected about how the department had been able to accomplish its diversity goals to-date. He very much credited Esther's ability to leverage her positionality and mobilize their colleagues:

> I think a critical aspect of this is that our long-term chair was a woman, Esther. And I think that, in addition to a general awareness among a reasonable large fraction of the faculty, helped from the very beginning to incorporate this awareness, at least. Knowing what to do about it, that's a different question. But at least it was part of the conversation in an aspirational way from the very beginning. And I think that's helped. If we had a different chair for the first ten years, it might be different.

As Rian recognized, Esther's own identity and beliefs shaped her routine approaches as a leader.

Routines: Intentionally developing the pathway. In fostering the diversity foundation that Esther set for ES from the beginning, the leadership continued to intentionally support outreach programs and efforts intended to diversify the pathway toward the professoriate and efforts that ensure that the applicant pool is robust with women and applicants of color. As noted previously, ES has been recognized for these successful efforts on campus, by its faculty colleagues, and by university administration. One of the most prominent pathways programs in ES is a cornerstone of the department's diversity efforts. Rian proudly described the program:

> One of the interesting things that came about [during the early years in ES] was the development of our master's pathways program […] And it was set up with NSF funding and led by a charismatic senior faculty member. And I think that was another key stamp in proceeding along this pathway. So, essentially, for the past 8 years we've tried to recruit 4 funded masters students because typically we don't have masters in our program, and from underrepresented backgrounds. And the point is that the program is a stepping-stone for them to do a PhD in our discipline […] overall it's been a remarkable success and it's helped diversify our graduate student body because many of those students stayed on to a doctorate. A fair fraction of them are here and that's really helped a lot, because when you change the complexion of the pool of students […] It helps us recruiting a more diverse faculty, because it is a visible sign that they can see that the composition of the department is diverse. That the department is not just talking about it.

While some units may only recognize the benefit of developing the pathway for the students engaging in the program, ES also recognizes the duplicative benefit of the immediate impact it has on prospective underrepresented faculty in showing a critical mass of women and people of

color in the department. Furthermore, the intentionality and repetition of recruitment, applications, review, and admit students to the program takes place very cyclically and creates a stable flow of underrepresented graduate students in the department. The processual nature of the program, and its rigid components, identify it as a (performative) routine on the CVF. This routine has clearly brought the department multi-fold success in diversifying the unit, through its students and its prospective faculty.

Moreover, another pathway program that ES touted was one that Esther was fundamental in establishing and shared about:

> We have something called the Rising Professional Scientist Symposium […] a symposium on a particular topic within ES that, instead of the usual suspects, we focus on early-career scientists – late PhDs, early, […] post-docs, maybe even a few first- or second-year assistant professors. And we bring them in and look at them with the idea that these topics will be something we want to be hiring – [are] especially interested in. [One of our star ES faculty] came from the Rising Professional Scientist Symposium […] We focus very much on making sure we have a very diverse line up. We also bring in a plenary speaker, a more senior speaker. We make sure that's diverse […] We've managed to just keep it going […] and we use it to keep an eye on cool people.

As an annual program, this symposium provides an opportunity for rising and early scholars to explore the campus and the ES department, and for ES to reciprocally have an opportunity to be exposed to rising stars. Furthermore, this symposium provided a handful of rising scholars the opportunity to showcase their scientific talents in a unique setting, while hosted by ES. As Esther mentioned, this annual symposium provides them an informal opportunity to monitor rising

scholars so when open lines and opportunities arise, ES members personally reach out to these scholars. The intentionality behind the selection of junior and senior presenters, with specific attention to their research and social identities, on a continual annual basis (since ES was founded), situates this symposium program as a performative routine (i.e., routine quadrant of the CVF). Even though the individuals involved in the line-up vary by year, the selection criteria and foci of the symposia continue to center around the same phenomenon – diversity within ES.

The development of pathway programs or similar efforts generally ends at recruiting underrepresented students and/or faculty into special programs in preparation for the professoriate. However, ES understands that the pathway does not end on the last day of these programs; rather, the pathway should take potential faculty to the application process. Therefore, ES leadership has worked intentionally to ensure that they, as a faculty, are developing diverse applicant pools. Rian shared the ways he mobilizes the faculty to collectively engage in developing a diverse applicant pool: "I've also told my faculty that we need to hire in such-and-such area – identify the best candidates who could fit any of these programs and get them to apply. Seed that pool with the people you want to hire. And I push that responsibility off onto them." In this sense, Rian places accountability on all faculty to work toward developing a pathway to ensure a diverse applicant pool. Rian also shared that he empowered the diversity committee to maximize potential for a diverse applicant pool:

> As part of this process I asked the diversity committee to look comprehensively at our hiring protocols […] And to recommend changes to maximize our potential to diversify the applicant pool. And that's where the focus was on diversifying the applicant pool and not setting the outcome. Critical difference – not all of my colleagues get this including some that are pro-diversity. They don't get that critical distinction. And it is important

> that they do because it is important that [the difference] is articulated correctly […] And we had revised the set of guidelines as to how we ensure maximum diversity in the pool and how we tweaked the application process.

By engaging the diversity committee in this manner, Rian ensured a systematic process for the development of a diverse applicant pool. In doing so, he intentionally continued to develop the pathway toward a compositionally diverse faculty.

Rian also recognized that he (as the chair of ES) could impact the development of a diverse applicant pool, or at least verify its composition to better understand who the applicants were. In strategizing mechanisms to increase the diversity of the applicant pool, Rian reflected on the following:

> So we have this default process where the applicants are supposed to fill out a background checklist. And typically, the uptake of that was 10%. […] And it was a little bit of a concern […] it was a black box when you've got 10% replying. You have no idea [if the pool is diverse]. And our diversity committee members were really quite focused on this […] So… I tried something, and it worked really well. The thing was to wait until many people had applied. And then as chair, I emailed all of them, individually. And I thanked them for applying and I explained to them that as part of the application they get this request about their background, essentially. And I explained why this is a critically important process for the university as a whole and for the college and for our department because we take this very seriously and we want to be sure that we are reaching a diverse audience. And asking them to do so and showing them an example of this is what I get from the college, right? It is just a few numbers. There are no names, no information.

> It's completely anonymous. "If you can do this, I'd really appreciate it." And the acceptance rate showed right up […] So we've done that with all the searches since, and that really helps. And we are getting a diverse pool.

Through this reflective process, Rian was able to better understand the demographics of the applicant pool. Beyond understanding the composition of the applicant pool, Rian developed a performative routine that is now regularly incorporated into every search process – his follow up with every applicant asking them to fill out the demographic survey. This focused attention is signaling to applicants that diversity is important to ES, and thus complying with the request to fill out the survey. With more robust data, ES has been able to better assess their recruitment approaches and understand what is working and what still needs more attention. In addition, Rian noted that this routine has also enhanced the reputation for Midwestern's ES program, as one that values and is concerned with diversity. That in and of itself, as they have noted with other strategies, became a self-generating means of developing a more diverse faculty.

Non-Routines: Empowering faculty as opportunity agents. While a majority of the leadership approaches that the ES chairs have taken in diversifying the faculty are categorized as routines on the CVF, they also realize that opportunity can sometimes be unexpected. Therefore, both Rian and Esther have been open to serendipitous possibilities that arise by empowering faculty as opportunity agents. One such example is the non-routine presentations that faculty engage in as an outreach venture. As Jeff commented, faculty members are empowered to represent the department in recruiting future graduate students and faculty wherever they perceive an opportunity:

> I personally went to all the community colleges within driving distance around here to talk to people. I gave research seminars at all these places, trying to get people enthusiastic about what we're doing at Midwestern University to get them to apply to this program.

Jeff's empowerment allowed ES to be showcased outside of Midwestern and attracted a broader scope of attention to the program. His individual presentations provided an opportunity for collaboration with other faculty (who may recommend future faculty applicants), exposure for outside graduate students to learn about the work that is taking place at Midwestern and think about the ways in which they could contribute, and simply shed light on the program in unique ways that otherwise would not be possible. This approach, mapped by its innovation and creativity, aligns with the non-routine quadrant of the CVF, where the outcomes are serendipitous at best, and the impact is often difficult to measure. However, ES's leadership continues to invest in supporting the faculty as opportunity agents in these ventures, as the department views all opportunities as good opportunities.

Summary

For ES, the evidence indicates that Rian and Esther have taken 7 main approaches to motivating their faculty toward change. These approaches stem from a unique history as a young department that seized the opportunity to reimagine itself upon establishment. Furthermore, the approaches taken to motivate change are varied, as the department is currently in a state of transition from the first chair to its second chair. The 7 leadership approaches that have been taken include: *a leadership framing tying environmentalism and social justice, fostering formal*

and informal collaborations, supporting and acknowledging diversity workers, retaining the competitive edge, leveraging positionality for change, intentionally developing the pathway, and *empowering faculty as opportunity agents*. These approaches represent behaviors and activities that are represented in all 4 quadrants (refer to Figure 9 for details). Through these primary leadership approaches, ES has progressively increased the compositional diversity of its faculty, ultimately working toward their goal.

Chapter IX: Qualitative Results – The Case for Information and Library Sciences

Overview

This chapter will introduce the case study for information and library sciences (ILS). In order to understand the primary leadership approaches taken within ILS, it is important to note that the recruitment and hiring for ILS takes place at the school-level as compared to the departmental or program-level, which is a major organizational distinction for this case. The leadership for the school is shared amongst three dean-level positions, with Mike as the primary leader. This organizational distinction is important in understanding the leadership approaches taken to motivate change within the unit to recruit and hire more women faculty and faculty of color. In particular, ILS has experienced success (as noted through the approaches in the following sub-sections) in hiring faculty of color, whereas many of the other units have experienced more success in hiring women faculty.

Historical context is also important, ILS being one of younger schools at Midwestern yet stemming from a much older disciplinary department, with rich traditions in service, leadership, research, and universal access to information. Figure 1d illustrates a plot of incidents coded for leadership approaches within the faculty recruitment and hiring process as noted by the participants. For ILS, some tension is noted in the values-based approaches taken by the leadership along both secondary dimensions of rate and magnitude of change; however, the data indicate that the unit leadership leans heavily toward collaborative and routine approaches in conducting this type of diversity work. The last 2 sub-sections provide the evidence to

substantiate the plotted incidents in Figure 10: *Speed of Change: Collaboration Through Support and Relationships at the Core of the Approaches* and *Magnitude of Change: Routines, Routines, and More Routines*.

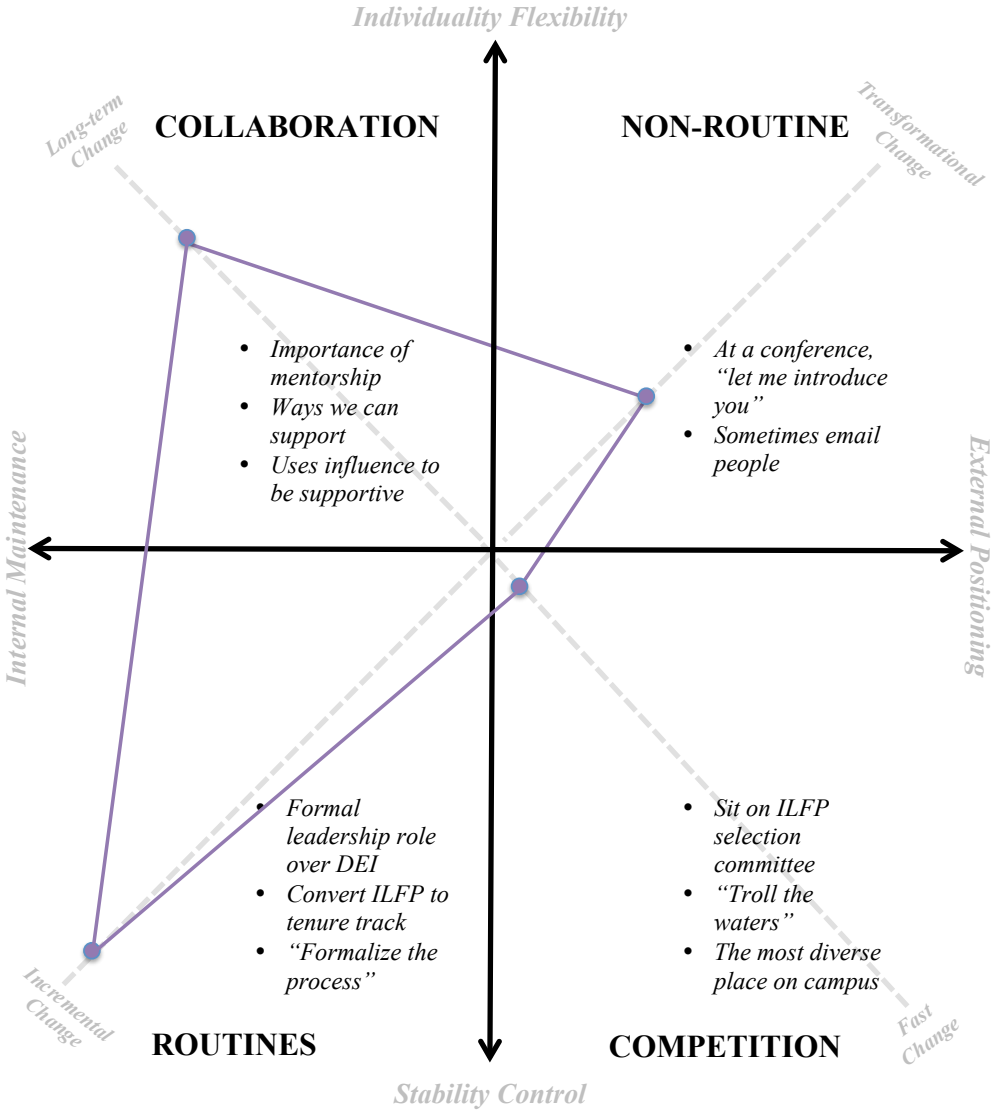


Figure 10. Competing Values Framework for the Faculty Recruitment and Hiring Process Reflecting Leadership Decision-Making in Information & Library Sciences

Historical Context: Founded for Interdisciplinarity and Faculty Unity

In an organization such as ILS, historical context is critical to analyzing its leadership approaches. The current organization (i.e., department/school of ILS) was intentionally developed to create an interdisciplinary space and unite faculty from various research areas in addressing broader issues of access to and use of information and technology. This historical intentionality continues to permeate the organization's practices and policies.

In particular, the organization's interdisciplinarity impacts its decision to handle all faculty hiring at the school level. Therefore, all department/program leaders work closely with the school administrative leads when it comes to any faculty recruitment and hiring efforts. When asked about the level at which the recruitment and hiring transpires for faculty, Liz recalled fondly:

> It's always been at the school-level […] ILS comes out of the old school of library sciences and information science. And when it was reformed in the 1990s, it was reformed as an interdisciplinary school to bring in more people, to examine information and emerging technology, and people's interactions with that technology in a much more interdisciplinary way. So bringing -- people from information science and library science and moving into psychology and economics and political science and computer science […] was very much an ethos of the school, to be interdisciplinarian -- to be one faculty -- and so we have always functioned as one faculty.

However, the interdisciplinary nature of the organization caused tensions when implementing other promising practices. While other units on campus were able to heed the advice of DTG directly, ILS had to consider some of their own individuality and reflect upon some of their

challenges in hiring as a school, rather than as a department or program. Liz shared this story to help illustrate why ILS has distinct approaches to its recruitment and hiring practices:

> When you have an open search in a school that has 7 or 8 disciplines, we couldn't. […] it caused a lot of friction. It is like, well then you are a qual person and a quant person. You know the book person and the conference-proceedings person. It was awful. It was awful. […] When chemistry does an open search, at least they're all chemists…Yeah, it just didn't work for us…I mean you didn't have enough of a comparison of anything that way, because you can't bring in 20 people, you know. So you're comparing a computer scientist builder to someone who does qualitative work with inner city youth around computational thinking. [Laughter] – It was impossible.

Historical moments such as this have impacted the way ILS chooses to implement their recruitment and hiring practices.

Leadership Framing: Diversity Helps Us "Make the World a Better Place"

In alignment with their interdisciplinary foundation, several of the leaders spoke of its relevance to creating a framing for the need for a diversified faculty. Furthermore, the framing that the leaders instilled to create a need for a diversified faculty stemmed from the unit's mission and vision. Kate excitedly shared how the dean infused this framing as new faculty joined the school:

> I think that it's been clear that he values the diverse faculty in the way that he talks about the strengths of the faculty coming in and what they bring and that they are working on these issues. So I think that ties in a lot with our school's vision and mission of wanting

> to connect people, information, and technology to *make the world a better place*. And that there is a really strong public-service ethos and a really strong sense that when you're building technology for people that you have to attend to their differences […] And so I think [it] is inherent that we are interdisciplinary and we work with different communities.

The innovative alignment, between the disciplinary mission and diversity, which ILS leadership chose to hone in on helps all faculty understand their expected commitment to diversity efforts. As such, the leadership in ILS has leveraged an ostensive routine (i.e., non-routine in the CVF) to motivate faculty toward change in diversifying the faculty. The ethos of public service that Kate spoke to was echoed by Liz when was asked about the framing leveraged by the unit's leadership for faculty diversification: "Part of it is the mission coming out of library and information science; there very much is still in our mission a service mission […] I think coming out of that to really address diverse people's needs, you need diverse people perspectives." It is evident that the leadership pulls on the historical ethos of the field and leverages its interdisciplinarity to move the diversity agenda forward. Through this non-routine approach, ILS scientists can align with and see themselves in.

Speed of Change: Collaboration Through Support and Relationships at the Core of the Approaches

With a historical foundation grounded in faculty unity, it is understandable that the leadership recognized that the most effective approach to motivating the faculty would be through collaborative efforts. While the bulk of the incidents coded under speed of change were primarily collaborative, the leaders in ILS also did not miss an opportunity to remain competitive

within the university in attaining resources. The following sub-sections will elaborate on the two main collaborative approaches: *embedding support structures for diversity* and *cultivating relationships through highly relational approaches.* This sub-section will culminate with evidence of the leadership's approach to *retaining a competitive edge*, as a balance in tensions across values-based leadership approaches in ILS.

Collaboration: Embedding support structures for diversity. With a disciplinary history and school mission deeply embedded in issues of social justice (primarily around service, universal access, and leadership), the ILS leadership built from that foundation to embed the structures they saw as critical for success for the recruitment and hiring of minoritized faculty. This embedding process began with a prior dean, well before the current leadership administration. Kate, one of the school deans focused on diversity efforts, recounted the instrumental embedding of mentoring support structures that the prior dean had incorporated. She shared that it began with:

> [A key faculty leader] taking on the deanship […] he was a founding faculty member of the school. He'd been through all of [the difficult history] and seen all of this. He was always a big advocate for diversity. I think he really put some more strength behind the importance of mentorship programs for our faculty and not just for recruitment efforts.

Kate's insight also spoke to the alignment that the ILS leadership began to make between retention efforts (as displayed through intentional mentoring approaches) and recruitment approaches. This prior dean planted the seeds that the current leadership is now cultivating. These are necessary collaborative support structures that ILS intentionally invests in. They are hyper focused on mentoring, diversity, and service to the community.

In formalizing the role of mentoring in the faculty recruitment and hiring process, Liz spoke to the opportunity that she takes with candidates to share the many mentoring efforts that she leads in her role. Liz shared that she primarily did so over breakfast during a candidate's interview visit, allowing her to speak candidly and authentically about these support structures as a recruitment strategy: "I really try to talk about the school and kind of the main issues […] because my area is both curriculum and faculty development. I do all the mentoring programs so I can talk about [what] both of those do." Furthermore, Liz proudly elaborated about one of the mentoring programs in particular that all new ILS assistant professors participate in:

> We participate in the university wide DTG New Faculty Mentoring program. And as part of that program, you need to identify an internal mentor. So every assistant professor has an internal mentor going into their second year. You know, in tenure and beyond, they have an internal mentor. In addition to that, there are monthly peer-to-peer meetings of the assistant professors […] If they want someone external to come in, [my assistant will] arrange the invitations. If they want something like, somebody had a cost or something – we'd pay for that. So there is that. The deans divide up the assistant professors every year so we at least, we go to lunch with all of them. Some of us go to lunch with the same one, depending on what's going on, but there is kind of that level of mentoring also.

In many ways, Liz's mentoring program also illuminates the ways in which leadership works purposefully to infuse support for increased success. While the attempt in this example was to illuminate the embedded mentoring that assistant professors receive, Liz also pointed to her assistant as a key resource that the assistant faculty have throughout this mentoring program, to ensure that their needs are met and that they feel supported in their onboarding process. It is

through these intertwined support mechanisms that ILS has formalized support for new faculty, thus creating evidence for prospective candidates that they too can be successful should they choose to join ILS. The mentoring mechanisms that ILS has in place signify the intentional collaborative approaches that they highly value. It was evident that ILS significantly values relationship building and a sense of community; thus these mentoring opportunities are reinforcements of the collaborative approaches they purposefully embed.

Moreover, since ILS recognizes that much of their additional recent success in recruiting faculty of color has come through the post-doctoral fellowship programs, the leadership has focused on ensuring that formalized mentoring structures are embedded into the post-doctoral process from the application through the arrival of the fellow. The leadership has recognized that their authentic mentoring makes faculty ideal partners for these entering fellows, thus increasing ILS's competitiveness for the post-doctoral fellowships overall. Mike, one of the current deans, proudly spoke to how the faculty communicated this in the support letters for the post-doctoral applications:

> We've been fortunate to attract outstanding [post-doctoral] candidates and we have had success and have been able to demonstrate our commitment to success. Our mentorship claims are not empty and so when the identified faculty mentor writes on behalf of the candidate they are able to say detailed, authentic – you know – concrete things, which is what you'd expect to see in a letter of endorsement, as opposed to "I looked at the packet the night before I wrote this and it looks good. I don't really understand what the person is doing." Platitude – platitude – that kind of thing, so I think that's been part of it.

Once again, the depth of commitment exhibited toward mentorship is evident in this collaborative approach. Moreover, the depth of commitment to formalizing support mechanisms for faculty throughout (in traditional hires and post-doctoral hires) speaks to the value that the leadership has placed on diversity and in ensuring the success of their new faculty.

Furthermore, the ILS leadership spoke to other mechanisms of embedded support, specifically in the faculty recruitment and hiring process. Unique to ILS, since the recruitment and hiring takes place at the school-wide level not the departmental level, the leadership has embedded a dean-level position specifically designated to support diversity, equity, and inclusion efforts. Some of this leader's primary responsibilities are to provide support and checks and balance on diversity-related topics throughout the recruitment and hiring process for the committee. This leadership role formalized the support that faculty receive in the recruitment and hiring process, but also in other retention-related areas concerning diversity. Kate, the dean responsible for diversity efforts, provided insights regarding the ways in which her role is crafted to support the recruitment and hiring process:

> In my role, what I do is I meet with the chair – oversight [search] chair and the individual [search committee] chairs – to kind of talk about the diversity aspect and kind of talk about what they're thinking about as far as implementing the CEDE training into their search, and are there ways that we could support […] I've seen a definite shift in attention to the way the postings are written, that there's some wording in the postings that kind of get at our diversity mission and desire for people who are going to help us achieve our diversity […] goals…I'll just pull out my DTG – you know my CEDE book – and say, "So kind of this, this and this," and then I do a midyear check-in with them as

> well, just to kind of see how it is going, are they on track [with their stated diversity goals].

Since diversity, equity, and inclusion are currently significant foci at Midwestern, many schools have similar leadership roles in the dean's office. However, ILS has formalized this collaborative structure through this dean role, which is committed to providing support throughout the recruitment and hiring process.

These formalized collaborative structures have led toward self-perpetuating engines for recruitment and hiring. Much of what the leaders and faculty in ILS commented on with regard to the school's collaborative culture is that it has fostered opportunities to continue highlighting the great scholarship of entering faculty and retaining them through these supportive mechanisms. Liz highlighted how supporting Richard's success into tenure has now become a self-generating mechanism of recruitment for other faculty of color as well. From her perspective:

> I think with faculty of color, I think having faculty of color on the faculty […] I think Richard has been [important] – you know I think having him here and…I don't know how to phrase it but he was someone people could come in and say, "He's here and he is succeeding." And then we got more and more and more so I think it does help.

Liz's example is evidence of how the informal mentoring is encouraged (especially amongst underrepresented faculty) and other retention strategies that the leadership have formalized are directly impacting both the success of the individual faculty, but also beyond, to positively impacting the recruiting of other faculty of color. ILS is fortunate to have recruited such a strong

scholar of color, and work diligently to retain him (Richard). In turn, they empower him to work collaboratively with others (especially other scholars of color) in creating informal mentoring networks. As is evident, ILS deeply supports and invests in human connectivity and human development as is characterized in the collaboration quadrant of the CVF.

Similarly, Kate shared regarding one routine where the dean has formalized introducing and highlighting new faculty and their research during an annual meeting. She noted that the dean names and shares some research information regarding every new faculty member at an annual school-wide meeting. This provides an opportunity for others to see the new faculty and hear of their diverse interests in hopes that they will connect and collaborate with them on future projects. The fact that the dean collaboratively takes this annual opportunity to illuminate the work of these entering scholars underscores the value that he, and the other leaders, see in them, their work, and more broadly, in diversity. This public introduction and recognition also serves to ensure that the faculty community is aware of new faculty and will make efforts to welcome them and promote the collaborative culture that is expected. These seemingly subtle approaches have become commonplace, formalized for ILS, and a foundation for the value they place on collaboration and diversity, as exemplified by the leaders' actions.

Collaboration: Cultivating relationships through highly relational approaches. For a unit like ILS, whose historical foundation was built on an effort to encourage faculty unity, it is understandable, if not expected, that relationships and highly relational approaches would take precedent. For this reason, the leadership in the school works intentionally to cultivate relationships with key faculty, and also empowers them to cultivate relationships with rising faculty and recruited faculty. Since Richard was the only faculty participant in this study for ILS,

and has been turned to as pivotal in recruiting faculty of color, his perspective helped illuminate this approach that the deans have taken.

The relationships that are cultivated in ILS are multi-tiered. The data point to incidents where relationships are fostered between the university and the school, between faculty and the deans, amongst the faculty, and between faculty and recruits. Richard shared how important he believes these relationships are in fostering a culture of diversity, which he later referenced as having contributed significantly to the retention of faculty of color. He commented:

> I mean I think [the focus on faculty diversity] comes all the way from the top, the university climate with the support. I think the dean is definitely actively seeking that. For me, I think I've done a lot to that in working with the dean's office. When it comes from a faculty standpoint […] I think the university has created a climate where it is incentive and I think ILS wants to see itself as a leader in that area. We want to see ourselves as the most diverse place on campus. I think the dean is very [committed]. He uses a lot of his influence to be very supportive. He's been very supportive in a lot of different ways to make it happen. And I think I've led the charge in some extent in terms of actually hands-on talking to people and working with the people. So, I think it's working well at all levels.

The ways in which Richard spoke of these multi-tiered relationships was an indicator of the highly relational approaches that are taken by leadership to foster authentic relationships with the faculty, and also to encourage opportunities for faculty to mentor and support each other. Mike discussed the collective joy the faculty experienced when Richard earned tenure, but also

recognized what a valuable resource that success became as Richard leveraged his positionality to foster deeper relationships with his colleagues:

> We went through a [significant period of time] until this fall when we did not have a tenured member of the faculty that was underrepresented. Richard got tenure, which is great for him, but it's great for the school because the URM faculty who are junior to him now see that someone did make it into the *promised land*. And then he has been very proactive about reaching into his – to all of his peers or all of his junior colleagues but with a specific focus on the faculty of color. He collaborates with them. He creates research groups and includes them. I think that's been a powerful – it's had a powerful benefit for us.

In this reflection, Richard notes his role as a mentor for incoming faculty of color, and also spoke to his intentional efforts in collaborating with them as well. This is one example of the collaborative approaches that the ILS leadership encourages, as high relational connectivity through one-on-one or group interactions is encouraged. Moreover, the data indicate that the leadership recognized the great value of supporting the success of underrepresented faculty (as a self-generating mechanism), and especially when they also cultivate a highly relational culture.

From his perspective, Richard has leveraged his relationship with the dean to cultivate stronger relationships with his colleagues and create a more inclusive climate in the school. Once the leadership recognized the great asset that Richard had been, they continued to foster his formal and informal leadership roles as a change agent within the school. Richard proudly shared his stance on these relationships:

I also think I don't have a problem being, I would say, the Black guy in the room. And so I think it takes off some of the pressure from them and they don't feel like all the attention is on them. I think that's the big thing. I can see how they would be very afraid and very isolated, you know if they wouldn't. […] I have sometimes had to sit down and talk to them and tell them "You're doing great. You're doing fine, just keep it up. Everything is fine." But it is a coaching session; I've had to talk to a lot of them repeatedly and coach them, especially the women […] I think that's the big thing; it is just people want to belong. They want to be accepted. So they don't want to be the Black person or the Hispanic person, right? [...] But then again at the same time they need some protection or they need someone to speak up: "Wait a minute, that's a little bit off track there. That's not fair the way you evaluate that person." And I have no problem doing that. Having someone say, "Oh, wait a minute, that's a problem," because they can't say it. I think they see how the rest of the faculty reacts. The rest of the faculty is open; they are not hostile. I think, when they see that, they feel better. I think that's what it is basically, this idea of facilitating between the white faculty and the minority faculty. It is just showing the minority faculty that you know there is no hostility. And then making clear to the white faculty, "I know what you did, but here is what they see. Here's what they are thinking." And in many cases, when they have problems when the minority faculty has problems, we talk, and I go to the dean and the dean will fix the problem. That's good, right? You have a problem and I can go to the dean. That's been the big, saving grace.

In the beginning of this example, Richard pointed to the role that he plays in helping represent and sometimes even defend other faculty of color who have not gained that agency with their while colleagues yet. That is a critical role that he plays in developing collaborations within the school, as it provides other faculty of color a sense of belonging. The key component of the relationship that Richard pointed to at the end of this example is the reciprocity that continued with each issue that arose. He mentioned several times throughout his interview how much he valued being able to go to the dean and the dean taking action because of their valued relationship. In this manner, the dean continued to cultivate the relationship on a regular basis to deepen its roots. Both examples of high connectivity leading toward a sense of belonging and inclusivity are deeply embedded values of the collaboration quadrant in the CVF.

With this sense of confidence that the leadership continued to cultivate in faculty, like Richard, ILS faculty are able to act as recruiting agents with prospective faculty on behalf of the school. In response to a question as to what he believed to be the strongest recruitment approach for faculty of color, Richard shared his perspective regarding the importance of the informal role he has taken with prospective faculty of color who inquire about the "real" experience in ILS:

> I think having people here of color that they can talk to and say, "Hey man, this is all right." I get phone calls all the time before people come, or after, saying, "What's really going on there?" That's the big thing; they want someone of color to say, "It's okay. It is all right," […] because they want to know what's really going on. If they don't have someone here then they probably won't take the job. And so they want to know, "Hey, how are things really going when no one's around? How do things operate? How does this go?" […] When I got here I was the only person of color and now every year we have a lot of people of color. And I can tell you [for every] person it's been basically

> sitting down with people and explaining to them and telling them: "It's going to be okay. Here's how things are." You have to sell the school when no one is around and, um, be honest. I'm honest. I don't lie but I think for me it's been the relationship with the dean. I feel comfortable going to the dean and saying, "Hey, this person is worried about this. Can we help this person? Can we help the person do that?" And I think that's the key thing, that I feel comfortable selling the school because I feel I know I'm telling the truth. If I didn't feel that way then it would be a problem. But I think they know that and once the second person comes and then the third person and then all of a sudden it gets a lot easier. Because now you look around and there are a lot of people here and it is okay […] But the other thing is people are concerned about isolation – even if [it's] not hostile, no one wants to be [alone]. Like when I got tenure, I think I was the first African American male to get tenure, and maybe the second African American person ever to get tenure here in the school…I think people don't want to be alone. I think that is also an issue.

Richard's transparency here spoke to the power and necessity of relationships in cultivating an environment where faculty can thrive, and also underscored the value of collaborative work in ensuring that faculty do not feel isolated and are expected to support each other. Richard's reflection confirms what much of the literature points to in stopping the "revolving door syndrome" (Moreno et al., 2006). It is in the authentic responses and genuine relationships that are fostered amongst colleagues that is hugely important – especially for faculty of color, as Richard indicated. In addition, as this collaborative network begins to grow, the pressure of isolation diminishes and a culture of success can continue to flourish. Thus, in this example,

Richard's unofficial role as the faculty of color that prospective faculty of color speak to off-the-record, serves as a significant indicator of the collaborative approaches that exist within ILS.

Collectively these coded incidents of highly relational approaches taken and/or fostered by ILS leadership are producing an attractive culture for prospective faculty of color. Like other approaches, it is not one example or one incident that can be marked as the indicator of success, but rather the collaborative approach of cultivating relationships that regenerate a highly relational culture for success.

Competition: Retaining a competitive edge. While ILS was established on the premise of a collaborative ethos, the leadership openly admitted to not missing an opportunity with candidates that would give them the competitive edge on campus or in the field. Mike spoke to his strategy in garnering a significant amount of post-doctoral fellows, relative to ILS's school size. The need to remain superior in the fellowships selection process and intentionality of his strategy have brought the school quite a bit of success through this classically identified competitive approach. In a sneak peek into his strategy, he shared his approach with the ILFP:

> I actually sit on the selection committee so I know what the committee looks for. They have a very acute understanding of authentic expression of mentorship intent versus formulate bogus expression […] And so that becomes a critical criterion. And then of course, the most specific criterion is the quality and caliber of the candidate. We've been fortunate to attract outstanding candidates and we have had success and have been able to demonstrate our commitment to success.

Mike talked about how his insider insight has helped ILS prepare successful applications to ensure favorable reviews. The insider insight is the competitive edge that he retains in the recruitment game for the ILFPs. He also shared that he is intentional about ensuring that he sits on the selection committee as he has noted the positive impact and competitive edge that it has provided the school in garnering post-doctoral fellows. Similarly, Mike shared the leadership's consistency in approaching senior hires. While there is less consistency in this approach, and often times is quite competitive in "tolling the waters" as he shamelessly admitted. In doing so, Mike recognized the high-risk and high-reward that comes with this competitive approach:

> Senior hiring is such a turkey shoot; you're going to get 1 in 100 you go after, so if you're not constantly asking or promoting the possibility, you're never going to get anybody […] Well, you have to communicate interest. That is what people are looking for and they're not going to come and knock on your door […] So we do a bit of trolling in those waters.

While competitiveness may be perceived as less virtuous than collaborative work in a culture like ILS', trolling the waters and gaining an insider insight on the ILFP as competitive approaches have allowed the school to leap ahead in hiring a significant number of faculty of color, including their super-star hire, Richard. He too articulated the school's competitive approach: "We want to see ourselves as the most diverse place on campus." In conclusion, ILS leadership primarily takes a collaborative approach to most leadership decisions as related to faculty recruitment and hiring; however, it openly admitted to not missing an opportunity to retain their competitive edge.

Magnitude of Change: Routines, Routines, and More Routines

In a case such as that of ILS, where the recruitment and hiring takes place at the school-wide level, the more highly organized the processes are, the more likely the unit is to reach their desired outcomes. As was noted by Liz, one of the deans, during a time when less structure was enforced, the school witnessed quite a bit of in-fighting over positions and chaos in the search process. Thus, with this historical backdrop, it is understandable that the current leadership has moved toward routinizing as many processes and protocols around resources as possible. In doing so, ILS has been able to significantly increase the number of minoritized faculty. The following sub-sections will illuminate the main approach that the leadership has taken in recruiting and hiring more faculty of color, that is: *"Formaliz[ing] the process so it runs like clockwork"* (as referenced by Mike in one of the coded incidents). There was also minor evidence of the leadership *empowering faculty as opportunity agents*, in a non-routinized approach that counterbalanced all of the routine approaches and allowed the unit to transform (in leaps versus increments).

Routines: "Formaliz[ing] the process so it runs like clockwork". Bearing in mind the complexities of hiring at a school-wide level, the leadership has moved toward formalizing all mechanisms related to recruitment and hiring in an effort to ensure collaboration and smooth processes. In a reflection regarding why the leaders feel the need for important plans, Liz commented: "Yeah. I mean it really [does matter]. And it is very awkward as a dean to have to reach down and say … 'Why doesn't this applicant meet your criteria? Explain it to me; I don't see it.'" The data show quite a bit of evidence of the leadership approaching faculty recruitment and hiring through formal routines.

One of the most prominent formalized mechanisms that the leadership instilled was the addition of leadership roles over diversity-related efforts. Liz highlighted the two that she found most significant: "I think Kate's [formal DEI role]. [And] Richard who is the current chair of our Diversity Committee has been an informal leader […] I guess he is a formal leader, being head of that committee." The creation of these formal positions not only highlighted the value of diversity, but also formalized responsibilities in areas relating to diversity, most markedly around recruitment and hiring. The rigid procedures and expectations within each of these designated roles, the specific persons holding the roles, and the cyclical nature of their responsibilities all signify how the development of these positions are, in fact, performative routines.

In many ways, ILS considers themselves a leader in campus diversity efforts as they began focusing on these areas before the big push came from the university. The major push has, however, been encouraged through the university resources and by leveraging the campus incentive that ILS leadership moved to formalize several structures that support retention efforts (which, as explained previously, ILS sees as a recruitment strategy). Liz proudly reminisced:

> I mean a lot of things – even before the university DEI plan on faculty and annual review forms, we would have: What's your diversity goal for the year? And that could be either teaching or research or, you know, something. So we'd been kinda doing things. I think the university plan made us more systematic about it.

The systematic approach to their DEI plan and measures are the performative aspects of the routine in this case. In a similar approach, the leadership moved toward formalizing the structures around university resources to provide units the best possible advantage. Mike spoke at length about the benefits of formalizing the process around ILFP hiring:

I think the faculty effort was actually largely independent [of our staff diversification efforts] and it grew out of the opportunity that ILFP program presented. So once the ILFP was rolled out in its full glory […] we saw that as an opportunity to grow the faculty independent of who it was who occupied that line. The way those work is if you make a hire and convert them onto the tenure track, the provost basically guarantees up to a ceiling of their salary for their duration of their tenure at the university. So it is really unencumbered from the point of view of the unit and I don't understand why more people don't jump at this because that's a pretty powerful incentive when you think about a whole faculty line, largely paid for by someone else. Why wouldn't you do that? So we jumped in on that and then over time we have nailed and formalized that process so that it runs like clockwork. And we have accommodated all the peculiarities at the university system, we essentially make candidates dual-apply to us, because the university won't show us their applications even [when] they are our candidate and even though we're going to be asked to make a decision about whether we are going to commit to move them into the tenure track. So we now have them apply to us so we see all of their materials and then we do the whole campus interview part in advance of the submission deadline for the campus program. So we've already figured out who we want and we've already had the faculty vote on them to vote them into the tenure line. When we make them an offer, it is for the post doc and we say "you will automatically convert to the tenure line absent moral turpitude," or whatever […] We find we get candidates we couldn't reach otherwise in terms of their preparation and aspiration.

Liz echoed many of these same sentiments and procedures. As Mike and Liz explained the benefits garnered by engaging in this university program, and subsequently explaining how they have moved toward routinizing the recruitment, selection, and application process for the ILFP applicants, it is evident how each step of their process is representative of the performative aspects of routines in the CVF. They have essentially mirrored, as best as possible, the ILFP hiring process with that of the tenure track faculty hiring process.

The ILS routine approach to formalize processes while leveraging university resources has truly given them a leg-up on hiring more faculty of color. Richard noted: "We have had and have a lot of success with that program…[since] they started that program." The data show that the faculty and deans proudly share the success that formalizing their process around the ILFP has brought them. Richard further expounded about their success:

> In the past 5 years […] We hired 3. So we got 2 African Americans through the ILFP post-doc, a Hispanic individual, and I think we're going to bring in two more – one an Asian American woman and one a transgender man. I think that's it. So we have the ILFP, which has really been great for us bringing people in, attracting people.

Likewise, Kate concurred from her perspective: "We've been really having a pretty strong success record with the ILFP program […] And we've been converting those ILFP post-doc candidates to faculty – regular faculty – boom, boom, and boom, so that is really helping us." Richard and Kate's perspectives primarily spoke to the impact of the ILFP on the growth of their underrepresented faculty. Although, Mike shared a long-term perspective on the ways that success with the ILFP has changed the composition of the school's faculty quite rapidly:

> We've already transitioned 3 of those [ILFP post-docs] into the tenure track successfully. And we have a fourth one that will start her second year as a fellow next September. And then we have an offer accepted. The campus gave us 2 slots this year. There are only 3 across the whole campus and we got 2 of the – I'm not sure they made 2 offers this year. I think we got to make both offers. And 1 of those has already been accepted and I'm still waiting on the second one…Yeah, it is awesome. And for a little school, that mechanism allows us to increase compositional diversity rapidly, which was our whole goal.

The success that these faculty and leaders discussed is a reflection of the routine approaches that they developed around their available campus resources. While other units may sporadically gain from partaking in the ILFP process, ILS does not leave opportunity to chance. They have recognized that routinizing the process increases their opportunity for success.

The success that the ILS leadership garnered by formalizing the ILS process was modeled on the protocol that they developed for open searches. As noted earlier, Liz highlighted that, in order to avoid conflict or uncomfortable moments, plans are important. She shared the formalized process from the beginning, with the announcement of a position:

> Generally I make [the announcement regarding an open position] but I don't make the decision that there is an opening; that's the dean […] Generally what we've done for the past – I don't know 5 or 6 years – is around this time I sent a message to the faculty asking them to formulate proposals for hiring for the next year. And so then they do those proposals, and those all go to the dean's advisory committee. And the dean and the dean's advisory committee talk about them and make recommendations to the dean. And

> the dean decides […] what [area] we're going to search for and how many positions we're going to search for […] then it kind of goes to me to work with the search committee to do job descriptions and to do, you know, any job ads – get it out, get the search committees activated to send [the ad] to their networks to see if there are any specific places we want to send it to, you know, that are more diversity kind of related, depending on what the job is.

The structured process (i.e., routine) begins with the proposal process from each programmatic area requesting their desired faculty lines, as described by Liz's comment. As one would anticipate with such a routine-based unit, the selection of the search committee is also an intentional process. Kate explained in detail the strategy behind committee member selection. The approach includes considering other faculty service assignments, their standing in the school (i.e., senior *v* junior faculty), their positionality in the school, and their social identities. The precision with which each committee member is selected for service, especially search committee assignments, is a distinct part of their success strategy in formalizing this embedded routine, as Kate pointed out. Moreover, the precision is also a distinguishing factor as a routine approach.

Furthermore, the formalization of the recruitment and hiring process has been outlined in a planning document that each search committee receives at the start of the process. Liz had been responsible for developing this planning document and ensuring that committees adhered to it. Liz briefly commented on the plan:

> I have kind of a procedures document which I have given [search committees]…I expect the head of the search committee to enforce that and [when] they haven't […] I end up

> reaching over and enforcing it […] one thing they all have to develop a quote-unquote diversity plan […] And as a school we have certain list-serves that we advertise […] that will reach kind of a larger group of people.

With diversity as a focal point for faculty hiring in ILS, Liz did further expand on the diversity plan expectations in the procedures manual:

> [The document] gives: by this date, you need to have a job description that is vetted. By that date, you need to decide how you as a group are going to vet applications and what criteria. People who get on the short list, is it – [do] you have a consensus? Is it a majority of the 3 people? How are you going to evaluate? Does everybody read everything? Does each of you read 2? You know, if you get more [applications], who are you going to bring in? The kinds of things that are more procedural. What're your criteria? If you are doing phone interviews, how are you doing them? Are they Skype with a video? Are they by phone? Just so everybody gets the same treatment all along.

Even though this level of formalization can sometimes create uncomfortable moments, the faculty understands that this structure is part of the designed process for success. It is in this specified process, enacted by the specific search committee members and deans, and during the specified timeline that squarely situates this approach as a performative routine.

Since DTG and CEDE have placed such a heavy emphasis on the wording of job postings, that point of the recruitment process was discussed in detail. As to be expected, ILS has a process for developing the job posting. As Richard noted: "I know they are pretty particular with the wording because people pay a lot of attention to that […] they make sure the language

doesn't reflect gender bias." To better understand the process that ILS takes when recruiting, Liz shared the following when asked about the job posting development process:

> I give [the search committee] a template, which our academic HR has looked over. And then they may add some around the specific disciplinary things in there. I've tried more recently to add some of the wording around preferences toward people who are […] doing work in areas […] that might have great impact in underrepresented communities or around different issues, so I've tried to add some DEI wording in them.

While adopting the CEDE recommendations of open searching did not prove to be helpful for ILS (as discussed earlier in this chapter), this example still showed evidence that they have worked to incorporate some of the recommendations with the added DEI language in the job posting. While other units on campus have incorporated the recommended statements from CEDE, ILS has further formalized their job postings into a template with little variation. This strict format as part of the broader hiring process is thus part of the performative aspects of the routines developed in ILS for hiring. For this unit in particular, the formalization of all aspects of the recruitment and hiring process for faculty has allowed it to reap the greatest benefits. Thus, the leadership has continued to approach all processes through routines based on success from these processes.

Non-Routines: Empowering Faculty as Opportunity Agents. Even though the abundance of evidence supporting the routinization of processes in ILS grounds the rationale for the leadership's primary approach to diversifying the faculty, a supportive and highly relational culture also explains why the ILS leadership continued to empower their faculty as opportunity agents. While this approach lacks routines and the hires that are acquired through this approach

are largely serendipitous, the leadership showed evidence of remaining open to the possibilities that might arise from empowered opportunity agents. Richard shared about the opportunities he has taken to recruit and network on behalf of the school, even when a position is not formally posted:

> What I've found on numerous occasions is that one, to get people here is a bit easier […] if I go to the dean and say, "There is a great African American minority; we should bring him here just to talk to him and have him meet people and see what happens," they'll fund that […] They'll bring him here […] Or if we're at a conference and I see African American students at a conference, I'll say, "Hey, let me introduce you to our faculty members or our dean." And they say hi to the person, right.

In another example, he shared:

> So we were at a conference and at that conference I think all of the African American students went to dinner together – just ad hoc, we all went to dinner together. And so we were talking there and that's how I met [my colleague]. So basically, I mentioned we were hiring in her [area]. She called me and wanted to talk individually about what was going on. You know, those kinds of networks where you can talk to people individually about this and that. "Hey, why don't you apply?" I think we do a lot of that. If there is someone we see at conferences or at spaces that we think are for underrepresented minorities, we try to put ourselves on the map to make them aware we're hiring. And we're inclusive.

Although the search process is very routinized in ILS, the process of developing a deeper and more diverse applicant pool can be more serendipitous as faculty are encouraged to be recruiting

agents anywhere, any time. The innovation they exemplify in the strategies they explore are reflective of the non-routine quadrant of the CVF, as is precisely the case with Richard's examples.

Beyond his own experiences, Richard shared regarding colleagues that are also empowered as opportunity agents: "We have faculty members like [my African American colleague] who has hooked up a network so we do spread the word out that we're going to be hiring and […] we're open to diversity." The deans empower the faculty to constantly seek ripe recruitment opportunities and not wait for the formal routine of the search process to begin.

Therefore, although empowering faculty as opportunity agents may add a chaotic rhythm to the process – since this approach lacks process – it also prevents missed opportunities. One of the prime limitations of search processes, as mentioned throughout several of the cases, is the timing of the posting. The ideal candidate for a specialty area may not be on the market when a unit has an opening, so ILS does not want to risk missing great talent and the opportunity to further diversify their faculty. Leadership's empowering faculty to find innovative recruiting opportunities allowed ILS to continue to thrive.

Summary

For ILS, the data underscore 6 main approaches that the leadership has leveraged in motivating the unit toward enhancing the compositional diversity of their faculty. With a school-wide mission and interdisciplinary foundation grounded in service, research, leadership, and universal access, it is understandable how Mike, Liz, and Kate work collectively toward motivating the school toward change. The 6 approaches they use are a *leadership framing focused on "making the world a better place," embedding support structures for diversity,*

cultivating relationships, retaining a competitive edge, "formaliz[ing] the process so it runs like clockwork," and *empowering faculty as opportunity agents*. Figure 10 points to key behaviors and characteristics exemplified within each quadrant (see for details). Jointly, these leadership approaches have allowed ILS to recruit, hire, and retain more faculty of color than ever before.

Chapter X: Qualitative Results – The Case for Physics

Overview

This chapter reveals the key findings for the physics department case study. The physics department is unique even amongst the other units selected in this study. While this unit has been recognized by university-level diversity effort offices for their commitment to diversity as exemplified by participation on university-wide committees for faculty diversification efforts, the impetus for their change developed from an external pressure years before and in some ways continues to thrive based on external pressures. Therefore, understanding the contextual history of physics is critical to analyzing the leadership approaches taken to motivate the faculty toward change in faculty recruitment and hiring practices. Figure 11 depicts a plot of the incidents coded for leadership approaches on the CVF, pointing primarily to collaborative and routine approaches with minimal competitive approaches, and no non-routine approaches. The final 2 sub-sections will highlight the evidence to substantiate Figure 11: *Speed of Change: Collaborative Approach to Faculty Diversification* and *Magnitude of Change: Solely Focused on Routine Approaches.*

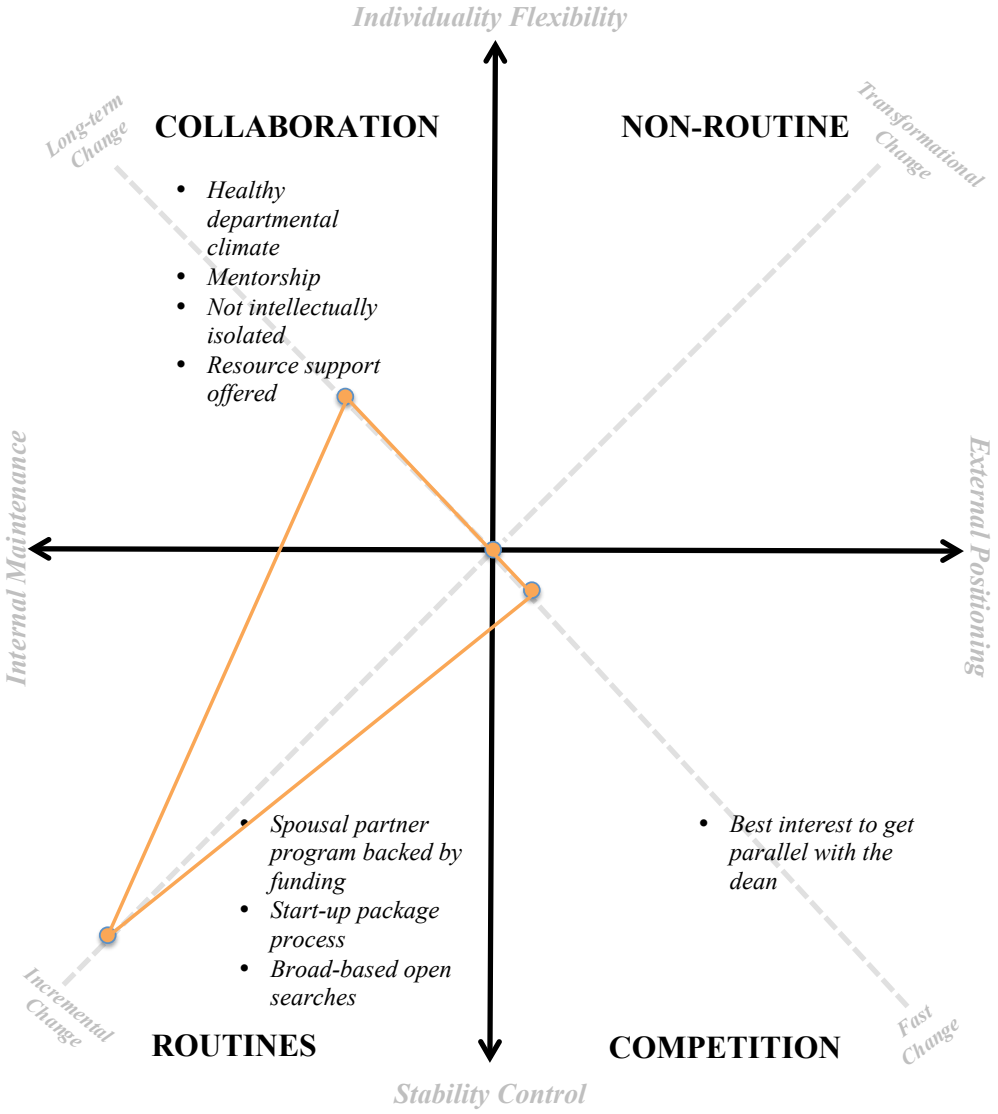


Figure 11. Competing Values Framework for the Faculty Recruitment and Hiring Process Reflecting Leadership Decision-Making in Physics

Historical Context: Investment in Diversity Started from Compliance

The historical context regarding diversity for the physics department stems from a point of compliance. In many ways, physics faculty and leadership all point back to the dean of the

School of Arts and Science (SAS) from a couple of decades ago, who was keenly focused on issues of faculty diversity – most pointedly with regard to recruiting and hiring more women faculty in STEM disciplines. Concurrently, the university was seeding efforts around faculty diversity through DTG and equity studies they were conducting in STEM.

A department such as physics, with a long history at the university, touting one of the first buildings dedicated to the discipline in the country, and now home to one of the largest faculty in SAS,[25] is likely to be challenged regarding any form of proposed change. In particular, physics has succeeded in sustaining its traditionally-minded culture and creating stability over time; however, this same stability has been the foundation for the resistance that the department has faced in moving toward a more compositionally diverse faculty. Jack, a longstanding faculty member and informal leader in physics within the department, university, and nationally, spoke to the historical tradition of the field:

> There is a lot of traditionalism in the field of physics intellectually, I mean just about the physics and about everything else that we do. You know the missed opportunities associated with that are kind of colossal. Physics is a funny field that had a golden era of power and influence. Let's put it that way, but I'm not sure it was golden in every way. But, you know, coming out of World War II, physics was the premiere science, the one that had access to the government and power and everything else. People who are on the faculty now, very few of them really were in their prime in that era anymore but most of them were trained by people who were in their prime in that era, who view physics as some highly privileged important field. And a part of their conservatism is related to that I think.

[25] It is also important to note that SAS is the largest college at Midwestern University. Thus, Physics has one of the largest faculty in the largest college on campus.

As this comment illustrates, physics needed the college and university to lead the change effort on diversification of faculty before introducing it to the department, as change would not naturally arise in an environment with such strong traditional roots. In an exchange with James, a prior chair of the department, regarding how the diversity efforts were driven, he recounted: "Yeah, the movement really was top down from the dean's office." Matt, the current chair, corroborated the sense that the push for change was external:

> The big push came from the dean's office […] It is certainly true among our younger faculty that this is seen as more important than among our more senior faculty. There is definitely a gradation in age. But I'm not sure that without getting an external push from the dean's office that we would have been as proactive as we are now.

Matt's sentiment clearly points to the dean's office as the motivator for the changes. That external pressure is now experienced at all levels of the university, thus external pressure continued to motivate the department. The chairs have enabled change based on this external pressure. James believes that the push for increasing compositional diversity of the faculty has expanded amongst the external leadership: "It is more than just the dean's office now. Now, you have more of a push out of the president's office. You have more of this being an institutional norm and we're expecting this from all our departments and such."

Physics has leveraged the push of the dean's and president's offices toward creating change, and has worked over the past decade and a half to bring the faculty along to valuing the need for a more equitable composition amongst the faculty. As James commented:

> There is certainly much less active resistance to it now. At the very beginning, there were a few people who were supporting these kinds of changes and there were a few people who [were] adamantly opposed to it. And then there is the broad middle who just wanted to do their research and teaching and not be drawn into this controversy.

The historical context of physics is important in understanding the core impetus for motivating change. The physics leaders, while invested in efforts, have allowed the true motivation to stem from external forces (primarily the dean's office in the early years).

Leadership Framing: We Are Lagging Behind

Often times, when significant efforts are made toward creating what can even be perceived as controversial change (such as hiring for diversification purposes), the assumption can be that the motivator needs to come from an internal source. With a historical context like that of physics, where diversification efforts stemmed from a sense of compliance with college and university expectations, it is important to understand the framing that leadership leveraged to push the initiatives to remain compliant with the campus and college expectations. The physics leadership heeded the opportunity to infuse several framings in hopes of helping colleagues buy in to the work and diminish resistance to the changes required. The leadership and faculty recall several framings that were shared by the dean, and subsequently within physics chairs. Matt commented about the history of the department and the framing that he recalled hearing from the leadership:

> I think there have been several framings, and not all of them would [the dean] have used. But I think if you looked at the U.S. population and its demographics and so, for the future of the field, I think it was pointed out you needed to enlarge your base of people

> you wanted to be collecting from. That was certainly an argument made […] There is no reason that men and women should be any different in this, and women are so vastly underrepresented. You need to look at everyone.

Matt's perspective spoke to the compliance framing that was infused throughout physics and SAS. The sense that the department was lagging far behind on diversity in comparison to the national landscape became the motivating framing that leadership imposed. Stemming from this framing, Marie, a faculty member serving on a departmental leadership committee, shared the more pervasive recent framing:

> Recently Matt's talked about it in terms [of] motivating [faculty diversification] through the graduate students actually largely […] Having a more diverse faculty is needed in the sense it is helpful to our graduate student population which is less diverse than many fields.

While the framing focus shifted slightly away from the lag in equity amongst the faculty, the new focal lag is on the graduate student composition and leveraging faculty diversity to increase student diversity.

The historical push from upper-level administration aligns well with the framing of compliance for diversity witnessed throughout the history of the department. While the literature may not support efforts of compliance in moving toward transformation in diversity work (Ahmed, 2012), physics has leveraged these framings to move the work of diversifying their faculty forward and creating positive change.

Speed of Change: Collaborative Approach to Faculty Diversification

Although physics leadership has allowed exogenous forces to serve as the primary motivators for change, the data point to the leadership taking collaborative approaches in enforcing these college-wide and campus-wide expectations. When considering the secondary dimension of speed of change that the physics leadership has gravitated toward, the data indicate that the leaders mainly use 2 collaborative approaches: *fostering a healthy departmental climate* and *providing mentoring for success.* There is some evidence that the leadership *remains savvy in the game* in order not to lose their competitive edge either in the college or on campus (with regard to resource allocation).

Collaboration: Fostering a healthy departmental climate. One of the approaches that faculty and leaders believe have contributed to their work and growing success in recruiting and hiring more minoritized faculty (specifically women faculty in physics) pointed to the *healthy* departmental climate that is fostered. The data point to evidence of fostering a healthy climate in various areas of the department as impactful on recruitment and retention.

Physics was thoughtful in referring to the department climate as healthy, as compared to other descriptors that are often used in diversity work (such as inclusive, diverse, collaborative, etc.). The data indicate that "healthy" is a reflection of the challenge and support that exists, as well as balancing of expectations. Marie summed up her impressions of the climate:

> I feel fortunate that we have a really collegial department overall […] It is like a healthy department, which is easier said than done, if you don't have a healthy department […] people don't always agree which is to be expected […] When somebody comes for an interview […][during] most of their interactions they get a vibe that it's a sort of healthy department. And people aren't all being snide against each other and so all of that feeds

> into a friendlier sort of place. And I think that comes through, again, in the selection process on the search committee – helps a lot, and when people are interviewing.

Marie added context to the development of this healthy culture by connecting the impact of the mentorship, which she, other junior faculty, and students have received, to the culture:

> I think […] that our chair values mentorship – mentorship by more senior faculty of junior faculty, mentorship of graduate students. And he values teaching a lot too, which I appreciated when I came here because I was coming from a national lab staff scientist position where I had only research responsibilities. And I consciously wanted to transition to a university position where I would have [both][…] Having a [healthy] culture and, in particular, probably I would imagine it comes up [with] the chair – during the candidate's interview when they meet with the chair. I would imagine between teaching and mentoring, the sense that our current chair values investing in young people's futures as a real investment […] Yeah, I think that helps [with recruitment].

Marie's reflections as a recently tenured professor were vivid and shared with a tone of appreciation. It was evident that she had reflected significantly on the influencers that impacted her success as a junior faculty member, and also as a woman in the department. The collaborative approaches – evidenced by the collegial environment and relationships fostered through mentoring – all are part of the healthy environment that Marie describes and very clearly appreciates. While in many units underrepresented faculty may shoulder the brunt of unrecognized service responsibilities, such as mentoring, Marie also spoke to how the culture that is fostered in physics, by the leadership, encouraged mentoring as well as research. She

shared that the faculty value their teaching, students, and their research that creates a much healthier and more balanced life culture. For Marie, knowing that her colleagues value the same principles of teaching, mentorship, and research create a supportive environment where collaborations are fostered, between the chair and faculty, faculty to faculty, and faculty to students. In fields like physics, where women faculty are so severely underrepresented, having the opportunity to mentor others and be mentored is an important signal of success, and of a healthy culture, as Marie also shared.

The healthy culture of physics is also evident during the faculty interviewing process. Throughout each candidate's visit, the chair and faculty take very specific roles that exemplify the healthy tone of the department. As the chair, Matt saw his role as much broader than questioning a candidate's science abilities. He understood that the campus visit was a two-way interview, in which the candidates were also learning about the department and assessing their fit. Therefore, Matt purposefully chose to take a welcoming, informative role, rather than an inquisitive one. This is how he viewed his role during the interview process:

> I look at my job as less of the assessment of the physics as it is in exposing the department at large, the university, the state. You know, what it means to come to Midwestern. People have some preconceptions of what that means. What is our standing in SAS? There are a lot of things I try to talk about which are a bit bigger. What is it like to live in [this city]? I view that as part of my role […] more than I think what other [faculty] will do. They're trying to get an assessment of: Will this person interact with me, in terms of his/her science?

It is clear that Matt took his role in the interviewing process as one of relationship building, as opposed to competitor in science. This is evident by the language and approach that he takes with prospective faculty, and the types of questions and conversations he chooses to host. Furthermore, although Matt suggested that the faculty inquire more so on the scientific qualifications of the visiting candidate, Marie also shared this comment on the general rationale to explain which faculty members are selected to meet individually with candidates during their interview visit:

> It's logical where a few points of contact [are] with[in] your research, you'll have contact with [a candidate]. You don't want the candidate to be in anybody's shadow but you don't want them to be intellectually isolated.

Marie's insight reveals the thoughtfulness that physics employed toward a candidate's work and visit. In some departments, scientists are seeking others that replicate their own work while in other departments, scientists want to ensure that replication of specialization does not occur at all. However each of these situations has proven to create its own issues: invisibility and isolation (respectively). Consequently, physics is mindful of finding a healthy balance for prospective faculty in continuing to foster a collegial environment. This mindfulness is a reflection of the collaborative approaches they are taking to attract more women faculty, in particular.

While some might argue that since these diversity efforts have emerged from a sense of compliance, these collaborative approaches are rather new. However, the evidence points to several long-time champions of a welcoming, healthy environment dating several decades back. Marie fondly recalled this anecdote that was once shared with her:

> There are two senior white males on the faculty who also come to mind as really being champions for creating a good climate and being very welcoming in doing that naturally – just doing that naturally themselves […] I know a woman who is, I guess, in her 70s now who did her PhD. She was actually in chemistry, but she was doing something that led her to interact with the physics department in the '70s […] And she has talked to me about how welcoming this senior male faculty member in the physics department – who is still on the faculty here – was to her as a woman physical chemistry student in the 1970s […] he's been very welcoming. He created a very positive environment over decades already.

Marie's reflection pointed to the collaborative approaches that had been seeded decades prior by welcoming faculty to the few women scientists at the university. This was shared as a reflection of the current environment that is continued to foster a healthy climate. It has proven to be quite beneficial to the department in retaining elite physicists, inclusive of those who also happen to be women, and also advantageous in recruiting more women faculty to the department.

Collaboration: Providing resources for success. Physics has recognized that by supporting their current women faculty, this healthy climate in turn served as its own recruitment tool. With this in mind, the leadership has been cognizant of ensuring that all faculty members have the resources (broadly speaking) that they need to be successful. When asked directly what she believed to be the best recruiting tool for minoritized faculty, Marie commented:

> So some of it is a bit of – not quite the chicken and the egg, but circular. I think the biggest plus in trying to recruit female and underrepresented groups to apply for faculty

> positions and seriously consider coming if they get an offer [is] seeing successful faculty from those groups at that department […] Support their tenure case; make sure they are getting enough guidance leading up to the tenure decision, third-year review procedures and transparency in this. I find that the current chair is very transparent and so I think several women faculty were hired under the previous chair and then he was the chair when they came up for tenure. And how [the chair] recognize[s] their achievements also, right, is all part of it.

This excerpt clearly points to the resources (monetary, human, and time) that the chair, in particular, has allocated to ensure the success of underrepresented faculty. Marie also clearly connects this success to the enhanced ability to recruit more underrepresented faculty. It is clear that Matt extends these resources in an effort to facilitate development and demonstrate high commitment to these faculty. These are characteristics that clearly align with the values found in the collaboration quadrant of the CVF.

Moreover, Jack pointed to the resources (monetary, political, and human) that the chairs have allocated to faculty and to students who are engaged in diversity efforts in his interview. From his perspective, these resources have allowed the chairs to leverage their positionality and power to highlight the value of diversity, and to encourage other physics faculty to continue this work. In commenting about the ways in which the leadership has motivated the faculty to value diversity, Jack reflected on this example:

> I would say department chairs find it hard to impose anything on departments. They really don't have a lot of way to do that. But they do control some resources and things

like that so when there are people in the department who want to do things, they can play a big role in making it easier or harder for them to do the things they want to do.

One of the early examples was the emergence of a Society of Women in Physics probably around [the mid-2000s]. That was a joint, undergraduate and graduate student group, which reached out to the women on the faculty as well. It became a pretty vibrant group […]And again I've seen the department take steps to try and make sure that they can pursue the things they want to do – that their voices are heard. They have a chance to drive the agenda a little bit. You know diversity measures across campus, future-oriented measures of any kind across campus, are somewhat emergent from young people. That's where the future comes from, and we see that present here in these kinds of activities as well. So lots of good department leadership I would say. There are a handful of people in the department who are very reliable supporters of all these kinds of efforts. It is more than a handful, I guess; it's really quite widespread.

In this example, Jack pointed to the challenge that all chairs face in only being able to guide faculty as compared to require certain behaviors. Thus his reference to resources that are provided are in light of the collaborative approaches that a chair, especially Matt, has to leverage in mobilizing faculty toward change.

Although the faculty argued that chairs have little power in obligating any type of change, Jack's example provided great evidence for leveraging resources to help motivate the efforts. In these instances, the data indicate that the chairs have leveraged monetary, human,

political, and time resources to incentivize the faculty toward changing their perspectives on diversity and to buy-in to the larger efforts around faculty diversification.

Competition: Remaining savvy in the game. Whereas the overwhelming leadership approach to motivating the faculty toward diversification efforts was more collaborative in nature, Matt does frequently point to the power that the former SAS dean held and the current one holds. In subtle ways, he pointed to his savvy strategies for remaining competitive in accessing resources (i.e., faculty lines, post-doctoral fellowship positions, etc.) on campus. In one instance, Matt directly stated: "He had an enormous amount of power. He controls whether you search or not. He controls whether your department gets money or not. And so it is in a department's best interest to get parallel with the dean." Matt's astuteness in recognizing where the power and resources lie were critical for the success of the department. While fostering a healthy culture and providing resources for success, Matt did not take his eye off of the competition and remained savvy in the game for resources. In this example, it is evident that Matt continued to position physics in the most competitive manner in discussions and proposals, as was necessary. In functioning as a "producer" for the department, he was behaving in typical fashion in accordance with the competition quadrant in the CVF.

Magnitude of Change: Solely Focused on Routine Approaches

Considering the historical context of physics being deeply grounded in conservative perspectives and stability, it is clearly understandable why Matt, and previous chairs, have prioritized routine approaches in aiming for incremental change. These approaches, as were explained in Chapter II, are the least disruptive to the organization and allow leaders to create low-risk change opportunities. For physics, the data indicate that Matt (and previous chairs) have managed faculty diversification efforts on this secondary dimension (of magnitude of change)

through 2 main approaches: *leaning on campus resources* and *routines grounded in expertise.* Although Physics could miss an opening provided by a serendipitous opportunity, the data indicate that the leadership has clearly elected strictly routine approaches (i.e., no non-routine approaches).

Routines: Leaning on campus resources. As evidenced previously, physics leadership has motivated change in the recruitment and hiring process by leveraging the external pressure they received from SAS and the university. The data show glimmers of evidence that the chair retains a savvy edge in competing for campus resources. Consequently, the chairs have developed strategies to ensure success in garnering campus resources as necessary for departmental growth and thriving. Thus, they have developed a routine approach of leaning on campus resources, while all other departments and units on campus are equitably eligible for campus resources. James openly admitted: "There still is clearly a [diversity] priority for the dean's office. We depend upon the dean's office for support in hiring and so on."

As might be expected, physics relies on the dean's office for open-line funding, but also for special funding and additional resources that may be needed throughout the hiring process. Matt shared this insight into the approach he leverages routinely with the dean's office to garner more resources for the department:

> So then the recruiting really is a responsibility for the chair's office, because recruiting involves making an offer, making a salary, answering questions, being competitive, negotiating a start-up package – and another component that is often an important component in the recruiting is often spousal issues. So, more often than not, the people we're recruiting have a working spouse and […]Having a very strong partner placement program at the college university level is really key for doing recruitment. And

> Midwestern University was one of the first [campuses] that had a strong spousal placement program backed by funding to support that.

These two examples that Matt shared are drawing a clear picture of the patterned locations where he, as chair, frequently relies on for support. The specific circumstances, with the specific people (in each designated office), during the specific time of the recruitment process, all indicate that physics has a performative routine of relying on campus resources for success.

Since physics views the offer stage of the hiring as part of recruiting, Matt elaborated on the recruitment approach he routinely strategized to create a competitive start-up package for the person(s) they would like to hire:

> We [generally] go to the college with our list of 3 ranked [finalists] and we beg to be able to make two or three simultaneous offers. We've been approved to make one offer; we will beg to make more than that, saying that because we're searching across *all fields* and we are not picking the best person in a field that the chance of this person coming here is no better than 30%. That's about our odds, and so, given that and the desire to have a successful search, let us make 2 or 3 simultaneous offers. The chances that a woman will be among those top 3 are much larger than they would have been via other routes. The college itself in the past has been pretty good about this.

Matt's strategy is evidence of his confidence in his routine approach and of his ability to rely on the dean's office for additional offers. His well-crafted scenario, with extremely well-crafted arguments with substantiated evidence, exhibits how Matt has developed a well-oiled routine around working with the dean's office on crafting offer packages. While other departments may

struggle to make the same *ask* of the dean's office, Matt has developed a successful narrative that allows him to lean on the resources provided by the dean's office during faculty hiring to give prospective faculty members the best opportunity for a successful outcome.

Moreover, Matt has approached recruitment and hiring by creating routines around the expected resources for which he bargained from SAS for a start-up package for incoming faculty. Since physics views the *offer* as part of the recruitment stage, the chair worked diligently to ensure that he offered the best start-up package to begin the negotiation process with a prospective faculty member. After 8 years as chair, Matt has developed a routine that allows him to lean on certain monetary resources to fund start-up packages. He spoke to this approach:

> I get approval from the college, put together an offer letter, which has the college's approval for start-up packages, and all sorts of goodies that faculty members get when they come. And then I talk to [the person we want to hire], invite them back for another interview, in which case they are not convincing us; we're trying to convince them […] So [the start-up package] is quite tailored. In our department, start-up packages will start at three-quarters of a million to a million and a half, depending on whether you are a theorist or an experimentalist…But if you are a computational person, you're going to need hours on a super computer. If you're a theorist, you're going to need post-docs. If you are an experimentalist, you're going to need a lab. And so all of that has to get negotiated really before I go over there to the college saying, "This is the candidate we want to hire; this is what the needs are going to be." And they go through all of that and approve that individually.

The precise nature of this process points to the routine that had been developed, and the pattern of behaviors that Matt has negotiated and shaped over the past 8 years to provide him the expected outcomes. Through this routine approach, of relying on campus resources, physics has grown in size, while working toward their goal of hiring more women faculty and faculty of color.

Routines: Practices grounded in expertise. This is the leadership approach that most of the faculty and leaders spoke to. They are quite proud of the success they have achieved by following the advice of campus experts in DTG and CEDE. As the college and university applied more pressure to departments to change their recruitment and hiring practices for faculty, they strongly encouraged investment in the strategies that DTG and CEDE were suggesting. As part of this move, Jack joined the campus-wide leadership team at CEDE, and since then became involved in leadership for ILFP and MTFP. He routinely disseminated the strategies garnered from these experts to physics. Jack commented:

> I have been involved across campus […] I spent 8 years on the CEDE committee […] and I have been involved in both the ILFP program and the MTFP program on the selection committees […][These programs] represent some of the main steps that have been taken [to diversify the faculty].

Through boundary spanning faculty, like Jack, physics has been able to develop effective practices for attracting more women faculty and/or faculty of color based in resources shared by these faculty. It is evident that Jack's service at the university level was on several of the committees he shared, thus it was expected that he would bring back the new knowledge and

help enhance the departmental approaches to diversity. Indeed, he did expand later in the interview the mechanisms by which he ensured that the CEDE, ILFP, and MTFP resources were implemented for the benefit of the department. This patterned behavior of engaging in university-wide committees, then returning with new knowledge and assisting with the implementation are all the parameters that signified that Jack was engaging in performative routines.

The approach that all faculty and chairs in physics appeared to be most proud of was their open searches. As DTG and CEDE regularly recommend, based on empirical evidence in faculty hiring practices, the more narrow and tailored a job posting is, the less diverse the applicant pool tends to be. Therefore, if the goal is to diversify the hiring, the departments must first work to diversify the applicant pool. While many other units on campus resisted this new approach, physics heeded DTG and CEDE's expertise and point to this as one of the most successful strategies in ensuring a diverse applicant pool. This approach was first introduced during James' time as chair. He reflected on the rationale he shared with the faculty and on the impact this type of search has had:

> One of the things we've done here – and this is actually, I'd say, a result of one of the recommendations that came out of the DTG study – was to do broad-based searches open to various fields. If, for example, you said, I want someone who is going to look at capillary data – a particular satellite telescope – then now, you've limited it to 5 people in the world. Whereas if you say, I'm going to look broadly across all fields of Physics, now you've opened it up to hundreds of potential applicants […] What that does is you've greatly expanded your potential pool of candidates. The disadvantage is the faculty who are advocating for a hire in their particular field. So people say, well I want to search just

> in my field. We need someone who is going to study data from the capillary satellite. [As chair,] you say, well, maybe the best person isn't in that field this year.

What James' comment spoke to is that, by grounding recruiting and hiring routines in the recommendations from the CEDE experts, not only was physics been able to hire more talented and compositionally diverse faculty, but it has also occasionally been able to acquire additional faculty lines as an unintended benefit of the process. Regardless of the resistance that persisted in the earlier years, physics has made open searches their only approach to searching; thus creating a performative routine around the way in which they conduct searches.

Additionally, physics had begun to include some of the CEDE suggested language in the job posting to encourage minoritized applicants to apply. Matt spoke frankly about the routine practice and wording used for the job posting:

> I might well inform the search committee [of an open line]: yes, we're going to be posting an ad. It's the same every year so there's not much that changes in it. Announcing a broad search across all fields and ending with a normal clause that says, "We encourage applications from minorities and underrepresented people." So, that's what happens.

This clear-cut process for posting is typical of routine behavior characterized in the lower left quadrant of the CVF. The evident expectations and the crafted language, with no flexibility for change, are the characteristics that align this approach with routines.

Leaning on the experts for this designated language has been fruitful. Here, the goal was to develop a more diverse and ample applicant pool, and as was noted earlier by Matt, faculty

postings are now generating close to 500 applicants. As physics learned, the only way to ensure that an underrepresented candidate is considered for the position is by ensuring that strong women physicists and physicists of color are in the applicant pool.

Based on the CEDE training that physics faculty members are required (by the dean's office) to take prior to participating on a search committee, Matt and prior chairs have understood that the moment that an offer is made, the window of opportunity reopens, as argued by Springer's (2002) research. As Jack noted, once an offer is made, the department now reenters the recruitment stage where Affirmative Action restrictions no longer apply. Leveraging this knowledge that the experts teach the faculty allows the department to negotiate and develop the best starting package possible for all new hires. Jack spoke to this process and the types of accommodations that have been considered in start-up packages:

> We can't offer a start-up package without input from the candidate. So usually they get told, "We want to make you an offer. You're our top choice." You say the best things you can about – whatever. You're transitioning – as we always described it in our CEDE discussions of how you should run this process. Once you make a decision then you are not in a search mode, you're not evaluating people; you can talk about anything and everything as soon as you make the offer. You have to cross that line to do it. But that's a moment when the chair would say […] We want to go to work immediately on understanding what you would need to be able to come here and really thrive as a scholar. And I think they try to say that in a way which evokes both discussion of the start-up package […] And anything else that might stand in the way of your coming – where "anything else" can be a wide range of things. You would like to spend another year in your post-doc before you come. You have a partner whose employment is

> essential one way or another or whatever it is – you might need legal fees to be paid because your partner will not be recognized legally in [this state] […] Or immigration issues – there are just lots of things that might emerge. What a good search does is say: "Please don't hesitate to tell us about anything we could do." Sometimes you can't do it, but you know – we certainly would want to know at that point.

It is evident from Jack's quote that his knowledge regarding the changing point between hiring and recruitment come from his training in CEDE. This is the pivotal moment that the entire opportunity hinges on, and physics has created a routine around the recommendations of topic experts. The routine encompasses engaging in CEDE training, incorporating their recommendations, returning to them with any questions, then relying on other campus resources for other expertise as needed. Creating routine approaches relying on expert knowledge has provided physics a foundation that has allowed their faculty to use a holistic approach to recruit from the strongest standpoint and negotiate the most competitive package possible for the candidate. This is a unique strategy that Midwestern propagated through the work of DTG and CEDE. Thus, by developing routines that are grounded in expertise, physics has not only grown in the compositional diversity of their faculty, but has begun to change their values around diversity from compliance-based toward commitment.

As noted earlier, the data indicate that the physics leadership has not broadened its approaches to include any non-routine approaches. However, the data do indicate that, organizationally, physics does take some non-routine approaches to the recruitment and hiring of women faculty and/or faculty of color. Unfortunately, that evidence and relevance are outside of the scope of this research study.

Summary

For the physics department, the evidence points to leadership motivating their unit toward change through 6 main approaches. All of these approaches stem from a historical context based on compliance on diversity issues, and a deep-seated conservative disciplinary culture. This historical backdrop illuminates the resistance within the department to any change, especially in their hiring practices, thus causing the leadership to leverage the external pressure to motivate the change. As a result, the departmental leadership has imposed these approaches to motivate change: framing that is grounded in a sense of "lagging behind," fostering a healthy departmental climate, providing resources for success, remaining savvy in the game, leaning on campus resources, and implementing practices grounded in expertise. As illustrated in Figure 9, these leadership approaches mainly ground the department in approaches aimed at long-term and incremental change (see Figure 11 for details).

Chapter XI: Qualitative Results – Comparative Case Study Analysis

Overview: Cross-Case Comparison across STEM Units – Leadership Approaches to Faculty Recruitment and Hiring for Equity

Drawing from the findings in Chapters V through IX, this chapter will present the cross-case analysis for this study. To understand the approaches that STEM departments/schools are taking to attract more women faculty and/or faculty of color, this study investigated the motivators unit leaders (i.e., deans, department chairs) have implemented to create necessary changes in faculty recruitment and hiring practices. As part of this study, 5 uniquely selected STEM units at Midwestern were analyzed for their perceived commitment to faculty diversification efforts as evidenced by their leadership on campus-wide committees dedicated to faculty diversification efforts. As discussed previously in the individual case studies, the 5 departments/schools included are astronomical sciences (AS), chemistry, environmental sciences (ES), information and library sciences (ILS), and physics. While understanding the approaches that individual leaders adopted in each unit is foundational this investigation, a broader understanding of the impact of the chair's/dean's leadership approaches requires a comparative analysis, as discussed in depth in Chapter III. As higher education scholars have argued, the role of leaders (i.e., department chairs, deans) is critical in shaping the values and beliefs of their units, and can deeply impact the hiring of an increasingly compositionally diverse faculty (Chun & Evans, 2015; Kezar, 2012).

In this study, the leaders' influence was most noted through the type of approach they took in motivating their colleagues toward change in faculty recruitment and hiring practices.

Although the approaches that the leaders could have taken range between collaborative, competitive, routine, and non-routine, department chairs and deans in these units overwhelmingly took collaborative and routine approaches. That said, there is also evidence of the willingness of a few department leaders to explore a few competitive and non-routine approaches. On a campus such as Midwestern, with a history of, and continued outward investment in, issues of diversity, the approaches taken align with the values of leaders units focused on internal stability and on the development of more buy-in to introduce incremental changes (Cameron et al., 2014) as a method of mobilizing their faculty toward a common goal (Chun & Evans, 2015) to enhance the compositional diversity of their faculty.

This pattern is consistent with that of organizations that work toward long-term change while prioritizing internal stability (Cameron et al., 2014). In light of the competing values that unit leaders contended with in creating change, considering the secondary dimensions of the CVF (i.e., speed and magnitude of change) offers one way to compare the approaches that leaders in this study have taken. Figure 12 depicts an overlay of the CVF plots for all 5 units, showing heavy leaning of leadership approaches in the collaboration and routine quadrants overall. However, there are unique cases that do show representation in all 4 quadrants, such as ES, and chemistry that shows a stronger pull toward non-routines than many of the other cases.

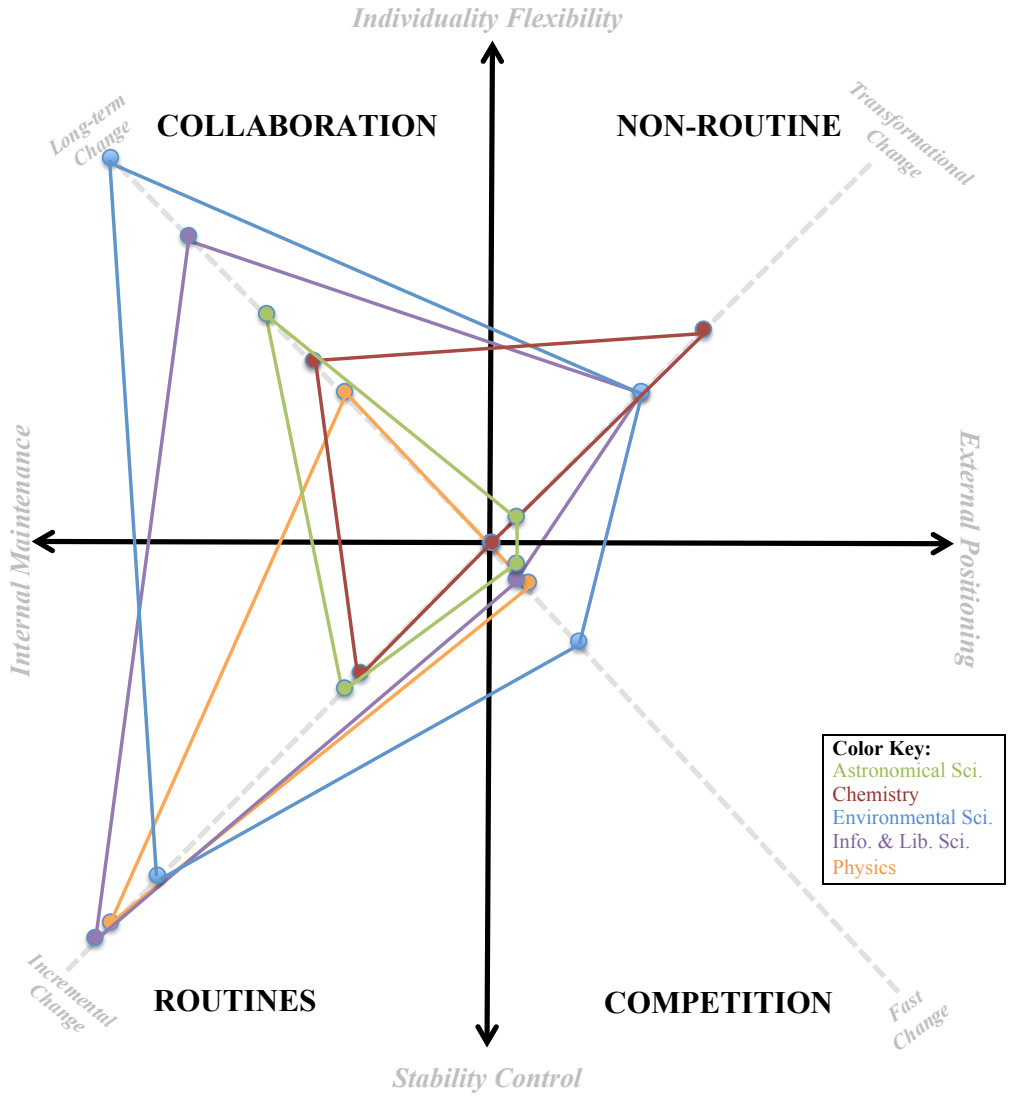


Figure 12. Overlapping Comparison of the Competing Values Framework of the Faculty Recruitment and Hiring Process Reflecting Leadership Decision-Making for All Units

Leadership Approaches to Motivate Change in Faculty Recruitment and Hiring Practices

Although distinct narratives – constructed by the faculty and leaders within each department/school – regarding leadership approaches to motivating change in processes aimed at

attracting more women faculty and/or faculty of color may be explained as unique based on unit context, similarities amongst several approaches across the units also exists. Table 8 provides an overview of the leadership approaches identified by unit across leadership framing and secondary dimensions of the CVF.

Table 8. Leadership Approaches for Recruitment and Hiring Practices by Unit, Framing, and Secondary Dimension of the Competing Values Framework (CVF)

		CVF SECONDARY DIMENSION OF CHANGE	
UNIT	LEADERSHIP FRAMING	*Speed of Change*	*Magnitude of Change*
Astronomical Sciences	Purposefully vague, yet focused on diversity and social justice	Creating a more equitable organizational climate	Formalizing diversity as a foundation and expectation
		Forcing participation	Never pass up a unique opportunity
Chemistry	An experiment for experimentalists	Capitalizing on watershed moments	Routinely rising from the ashes
		Leveraging of positionality for change	Routines grounded in expertise
Environmental Sciences	Naturally, the discipline is open to social justice	Fostering formal and informal collaborations for diversity	Leveraging of positionality for change
		Supporting and acknowledging diversity workers	Intentionally developing the pathway
		Retaining the competitive edge	Empowering faculty as opportunity agents
Information & Library Sciences	Diversity helps us "make the world a better place"	Formalizing embedded support structures for diversity	"Formaliz[ing] the process so it runs like clockwork"
		Cultivating relationships through highly relational approach	Empowering faculty as opportunity agents
		Retaining the competitive edge	
Physics	We are lagging behind	Fostering a healthy departmental climate	Leaning on campus resources
		Providing resources for success	Routines grounded in expertise
		Remaining savvy in the game	

While unit leaders varied in values, beliefs, life experiences, and social identities, the approaches they took to motivate their colleagues toward change did show some alignment. Based on the evidence in this study, chairs/deans took 8 approaches while motivating their units toward change in their faculty diversification efforts. Each approach is individually grounded in the values and behaviors that operationalize the quadrants of the CVF with which they align (i.e., collaborate, routine, non-routine, compete). The following sub-sections will explicate the various mechanisms implemented – similarly and uniquely – for each 8 leadership approach identified.[26]

Approach 1: Instilling a disciplinary-based framing to motivate change. The leaders of all 3 units – chemistry, ES, and ILS – identified the success they experienced in mobilizing their colleagues toward changes in the recruitment and hiring processes after imposing a framing that aligned with their disciplinary fields. By framing this new process as an experiment Diana managed to lower the sense of risk that her colleagues in chemistry felt in trying the strategies advised by CEDE. As she stated, and Judy concurred as to the winning strategy, Diana was savvy enough to know that, as chemists, her colleagues were by training experimentalists. Thus, if she framed this new process as an *experiment* whose findings they could accept or reject, as they did with any other study, it allowed her to move past their resistance.

Likewise, in ES, Esther's framing was well grounded in the historical evolution of her field. She understood that each environmentalist in the department understood the value of diversity from a biological perspective, so she aligned the rationale for diversifying the faculty with this value for diversity and social justice. Doing so allowed her to mobilize her colleagues

[26] Noteworthily, each of these 8 approaches has been identified by the 5 units that participated in this study as a success strategy in diversifying STEM faculty.

and move past the resistance that predated her term as chair. In the same vein, ILS' disciplinary traditions focus on service, leadership, research, and universal access. The deans found success by imposing a framing for work on diversity that was grounded in their existing disciplinary traditions and in their school mission. Doing so allowed the faculty to remain invested in diversity efforts and leadership to move past any resistance.

As higher education scholars argue, chairs are at the core of the value-creation process for the department and the campus (Chun & Evans, 2015). Consequently, the chair's framing of values regarding diversity is often informed by disciplinary field, lived experiences, and social identities (Kezar, 2000, as cited in Chun & Evans, 2015). As a result, the tone and framing with which deans and chairs in this study approach the need for change in the recruitment and hiring practices for faculty can have a deep impact. While other unit leaders have imposed broader based, and even externally driven rationales for diversity efforts, they have been met by more consistent resistance than the leaders who have leveraged the identity of their field and connected it to the core framing in motivating their units toward change. By leveraging these disciplinarily aligned framings, the chairs/deans of these 3 units were able to move toward formalizing many of their recruitment and hiring practices, and toward formalizing their collaborations, relationships, and programs.

Approach 2: Focusing on organizational climate. Both AS and Physics chairs leveraged an internal focus on organizational climate as a motivator in attracting more women faculty. This approach harnessed the collaborative behavior that is needed to develop a healthy, inclusive climate. Furthermore, the approach is noted through the types of behaviors (i.e., facilitation style, mentorship) exhibited by the leaders that fostered collaboration (Cameron et al., 2014).

Marc, the AS chair, had been diligently working on creating a more inclusive climate, primarily through the efforts of the Diversity Committee. He had encouraged and supported their work, which led to broader changes, including gender-neutral restrooms, more gender-inclusive photographs on the department walls, and stickers and t-shirts with a diversity motto. Marc and the members of the Diversity Committee considered these signals of an inclusive environment, and indeed fostered an expectation of inclusivity, which in turn served as a self-generating engine during faculty recruitment. Furthermore, Marc spoke to prioritizing his intentionality in working on the internal climate of the department. While his primary concern was to foster a climate allowing all faculty members to be successful, he also recognized the power that that inclusive climate has on those considering whether they should apply for or accept a position.

In a much less intentional manner, Matt (the chair of physics) has cultivated a healthy environment (as Marie discussed). He has done so mainly through his mentoring of junior faculty (who happen to be the most compositionally underrepresented in the department) and instilling a sense of transparency regarding the departmental expectations and processes. Matt is mindful of fostering these support strategies throughout his daily routines. However, inadvertently, this approach has become a self-generating engine to help recruit more women faculty into the department. As Marie discussed, other women see that the women faculty are supported and are successful, which in turn projects a sense of a healthy culture where they too can succeed.

As higher education scholars have argued, retention of minoritized faculty is a critical component of recruitment and hiring of more minoritized faculty (Griffin et al., 2011a; Griffin et al., 2011b; Reyes & Halcon; Stanley, 2006) especially in avoiding the "revolving door" syndrome (Moreno et al., 2006). Moreover, Greene and Stockard (2010) contend that the

gendered departmental climates exacerbate the inequities women experience, leading to high levels of departures. The leadership approaches taken by AS and Physics, to focus internally on fostering inclusive and healthy climates, align with this literature and underscore the value of this approach not only in retaining minoritized faculty, but also in recruiting them.

Approach 3: Cultivating relationships. Both ES and ILS have leveraged the cultivation of highly relational environments and formal partnerships as a motivational mechanism in their change efforts. Their primary focus was on "supporting human interaction" while "emphasiz[ing] the development of effective relationships" (Cameron et al., 2014, p. 39). Although both ES and ILS leaders leveraged the cultivation of relationships as motivators for change, the processes each unit undertook were distinct.

In ES, the chairs (and key faculty) touted their formal and informal relationships as critical in enhancing the diversity of their faculty over the years. Most prominently, Esther (the previous chair) credited much of the progress in this area to the informal collaboration work that she had conducted with a few other key faculty leaders in the early years of the department. Moreover, both Esther and Rian (the current chair) acknowledged the efficacy of several of their formal pathways programs in diversifying their department. Through these formal relationships which they have continued to encourage, the department has noted an increase in the diversity of applicant pools, thus potentials for a woman and/or person of color to be considered for the recommended hire. Although there have been ebbs and flows within the programs, it has been the strength of the relationships that has continued to drive faculty innovation for new strategies.

Conversely, in ILS, the deans have cultivated a highly relational climate, both personally with key faculty and also amongst faculty and their peers and recruits. This was evidenced most prominently in the relationship between Mike (the current dean) and Richard (faculty). The depth

of this relationship allowed Richard to share diversity concerns with Mike and to know that resolution would soon follow. The collaborative nature with which Mike ensured that this relationship continued to develop was key to Richard's then reciprocating and developing supportive relationships with junior faculty of color and recruits of color. Richard's role in supporting junior faculty, and helping create a sense of belonging for them, was critical in their success within ILS. In addition, Richard's informal role with recruits of color in providing an honest insider perspective about the departmental culture and about his experience significantly increased the likelihood of a recruit's accepting an offer. In fact, Mike's approach of cultivating relationships has been one of the most effective strategies that ILS has implemented in recruiting faculty of color.

These cultivated relationships, in both ES and ILS, are evidence of the "human development and high commitment [that] produce effectiveness" (Cameron et al., 2014, p. 32) in working toward attracting more women faculty and faculty of color. This collaborative approach has allowed ES and ILS to prioritize human and social capital over the outcome (Cameron et al., 2014), which in turn has created an environment of support that naturally attracts more minoritized faculty. Furthermore, this approach also impacts retention of junior women faculty and faculty of color, which becomes its own self-generating engine, as has been described previously.

Approach 4: Formalizing diversity practices. Both AS and ILS leaders have leveraged the formalization of diversity practices by creating routines around their recruitment and hiring practices (and other related diversity efforts) to influence change in their units. While routines are operationalized as repeated processes or practices (i.e., behaviors), that are adjustable in the face of contextual changes (Winter, 1964, p. 263 as cited in Becker, 2004), the mechanisms used

to implement these routines for faculty recruitment and hiring of women and/or people of color may vary. Some of the routines evidenced in this study are annual recruiting and outreach programs, standing committees focused on diversity, and plans prescribed specifically for the faculty recruitment and hiring process. The value of developing and implementing routines in these processes is increased organizational control and stability (Cameron et al., 2014), which often allows leaders to create a lower-risk environment for their constituents, especially resistant constituents. However, as Feldman (2000, 2003) argues, routines also allow individuals to exhibit their agency by adjusting to or deviating from them to create change. For both AS and ILS, the leaders (i.e., chair and deans) leaned on the power of routines in creating a unique opportunity for change in their faculty recruitment and hiring practices.

In AS, Marc implemented routines around diversity and the value of diversity by establishing the Diversity, Equity, and Inclusion (DEI) Committee. The DEI Committee was a standing committee with specific role expectations, including providing advice and recommendations to the chair on all diversity-related issues, insights on hiring processes, and recommendations for mechanisms to foster a more inclusive climate for all. Not only did their establishment as a standing committee and their roles reflect routine behaviors, but the precision with which the membership of the committee was selected also embodied a routinized annual process on the part of the chair.

While the establishment and continued support for the DEI Committee in AS has cultivated more fertile ground for support of diversity, the faculty and chair have pointed to the post-doctoral hires as the most significant marker in hiring more women faculty. Beyond the gains in the number of positions from these post-doctoral hires, Marc has been working diligently to help resistant faculty buy in to these opportunities. Since the department has not

been granted an open line in a significant period of time, even diversity-worker (Ahmed, 2012) faculty had grown resistant to this non-traditional hiring path. Thus, within the routine of the post-doctoral processes – which are hosted at the dean and provost level – Marc sought an opportunity to deviate as much as possible within the parameters of the programs, and to develop a hiring process that mirrored their open-search process. This is still a newer routine, but it has allowed Marc to motivate his colleagues in engaging these post-doctoral opportunities. The one consistent routine shift that he made a few years ago was to offer a tenure-track position with every post-doctoral hire. The stipulations of the programs outline that the post-doctoral fellow (both ILFP and MTFP) would be considered for a faculty position, if one was open and available at the time of application, and Marc took it upon himself to deviate and create the new routine of offering the faculty position in the post-doctoral offer letter. This was a game-changer for AS, and increased the competitiveness of their offers in the field. The agency that Marc exhibited in these routine processes (to deviate and adapt to a new routine) has resulted in increased faculty alignment on diversity hiring opportunities and has made the departmental offers much more competitive, therefore leading to more women faculty joining the department.

Similarly, Mike and Liz, in particular, have worked tangentially to develop "well-oiled" routines within their faculty search processes, which are foundational to the culture of routines that they are embedding. Their goal has been, as Mike referred to it, to "formalize the process to run like clockwork." In this he was pointing to all recruitment and hiring practices, not only open-search processes. ILS' meticulous formulation of their search process, detailed in their search-process document, is evidence of this expectation. This document outlines all expectations regarding CEDE training, application-review process, diversity plan for the search process, candidate-selection process, and interview process. This is subsequent to the thorough

process that Liz engages in to select the search committee chairs and members (all included in the routine required for each search process). To ensure the flow of this routine, ILS deans have embedded support structures and checks-and-balances stages in the routine. For ILS, all details in the search process have become routine, and the leaders have clearly articulated the success they see from formalizing this process.

Moreover, ILS leadership has incorporated the same routine expectations for open searches into all post-doctoral hiring processes. Similar to AS, the ILS leadership has worked within the parameters of the program expectations, and has deviated slightly to create routines that emulate an open hire in developing a stronger sense of equity for all hires. In both units, formalizing post-doctoral hiring processes has allowed them to motivate their colleagues to invest in these opportunities.

Formalizing these diversity practices, especially the recruitment and hiring practices, is also evidence of the leadership's clarity about the type of candidate and search the unit wants to implement. In doing so, deans and chairs are able to clearly communicate these expectations from the start of the search through fruition, which has a tendency to lead toward more successful hires, especially of minoritized faculty (Delgado-Romero et al., 2007). We can thus see that, in executing their individual agency, the leaders in AS and ILS have effectively worked to deviate from traditional routines set by external units, and have adjusted them to the greatest benefit of their units, and have ultimately led to the successful hiring of more women faculty and faculty of color.

Approach 5: Routines grounded in expertise. The chairs of both chemistry and physics implemented routines grounded in their expertise as motivators for change. While routines provide insight into organizational spaces where tacit knowledge is stored, applied, and changed

over time (Becker, 2004), they can also be the windows of opportunity for positive deviance that creates new knowledge sites, and thus new routines. In many ways, recruiting and hiring are ideal processes by which to implement routines for this very purpose. Although both Chemistry and Physics implemented routines grounded in expertise – developed by DTG and CEDE – the processes by which each leader did so varied due to their departmental histories and the perspective from which they introduced the new knowledge shared by DTG and CEDE.

For chemistry, whose history is tainted by the attrition of women faculty and poor climate influenced the department's openness to recommendations from experts in faculty recruitment and hiring. While department members were experts in chemistry, they came to realize that they were not experts in recruiting and hiring women faculty. In turn, as the chair, Diana regularly leaned on the campus-wide experts in DTG, and subsequently CEDE, to provide her with the necessary research to substantiate the changes that were needed in faculty-search processes. She recognized that as scientists, her colleagues would not argue with empirical research. Therefore, Diana developed routines and partnerships with DTG and CEDE to seek the research-related resources that she needed to mobilize her colleagues toward change. This was a cyclical process that allowed them to successfully incorporate changes to the language they used and conveyed throughout their recruitment processes, and to job-posting language as they moved toward broad searches from narrow searches. These routines that Diana grounded in research developed and disseminated by the recognized experts on campus in this area allowed her to motivate her colleagues toward the changes that were necessary to attracting more women faculty.

Conversely, Physics – whose departmental history with diversity stemmed from a position of compliance – also developed routines grounded in expertise devised by DTG and CEDE; however, the leadership in this department sought these experts in order to meet the new

school-wide and university-wide expectations regarding increasing compositional diversity of faculty. In doing so, James (the prior chair) leaned on the resources that DTG and CEDE offered and guided his colleagues toward the incorporation of the experts' recommendations, most notably: open searches, the addition of diversity language to job postings, and understanding the flexibility that hiring units have once an offer is made to a candidate as they re-enter the recruitment phase. In addition, key faculty members, such as Jack, joined the leadership team at CEDE and assisted in disseminating the advice from DTG and CEDE. Collectively, between the success that Physics began to see by implementing the suggested strategies and by the investment of respected colleagues like Jack in CEDE's work, the leadership (and thus, the department) began to create regular routines around seeking insights and new knowledge from DTG and CEDE to improve their recruitment and hiring practices overall. Physics also has incorporated this new knowledge into internal post-doctoral hires. Whenever new faculty searches, of any type, are to be conducted, physics chairs now have integrated changes in the hiring routines and routines for seeking new insights from campus experts to enhance their opportunities for success.

With the role of chairs primarily focused on guiding their colleagues toward change, much like an orchestra conductor marshaling musicians, these leaders must rely heavily on the respect they earn through their leadership ability, their disciplinary accomplishments, and the expertise they bring to bear on their role (Chun & Evans, 2015) to mobilize their colleagues. The chairs of both chemistry and physics depended on the campus-wide experts in DTG and CEDE to regularly provide them with the new scholarship and knowledge they needed to gain the respect of their colleagues in creating change.

Approach 6: Empowering faculty as opportunity agents. The leaders of all 3 units, AS, ES, and ILS, have advanced change efforts in their work to attract more women faculty and/or faculty of color through this non-routine approach of empowering their faculty as opportunity agents. Although the approaches that leadership has taken to motivate change are mostly categorized as collaborative and routine, these 3 unit leaders have been open to serendipitous approaches as well. Considering that non-routine approaches can be defined as opportunities in the recruitment and hiring process that include "thoughtful rule breaking and stretching beyond barriers to innovate," these have been some of the windows of opportunity the chairs and deans have been willing to engage in to "leapfrog" and "achieve breakthrough levels of achievement" (Cameron et al., 2014, p. 36) in hiring more women faculty and faculty of color. Moreover, research on transformational change in higher education notes that "successful change leaders recognize windows of opportunity created by everyday events and capitalize on serendipity" (Eckel, Hill, Green, & Mallon, 1999, p. 5, as cited in Smith, 2009). However, this non-routine approach is only possible when leaders have a "clearly articulated vision for the future" (Chun & Evans, 2015), which corroborates the argument that Delgado-Romero and colleagues (2007) made in their study regarding strategies for hiring more faculty of color – specifically Latina/o faculty – highlighting the necessity of clarity from leadership for faculty diversification efforts.

Scholars have pointed to agents of change as the main facilitators of change, especially in conducting diversity work (Chun & Evans, 2015; Dowd & Bensimon, 2015; Kezar, 2012, 2014), though in these 3 units the leaders are empowering faculty as opportunity agents. The agency that is emboldened within faculty in these units is in looking for ripe opportunities that will benefit the unit's larger goal of enhancing the compositional diversity of its faculty. Each

unit has varied examples of this kind of emboldening, but they were part of the flexibility and chaos that each leader was willing to engage in in order to empower faculty as opportunity agents. This non-routine approach requires chairs and deans to be intricately involved in guiding their faculty, and facilitates these serendipitous opportunities (Chun & Evans, 2015).

In each of the 3 units, the faculty – acting as opportunity agents – communicated clearly with the chair/dean about either their intentions or results from a unique "find." In AS, Tracy spoke of the uncharacteristic post-doctoral opportunity that a now-colleague created to bring her into the department. Similarly, in ILS, Richard spoke of the continual recruitment mode in which he functioned. He shared many instances of taking the opportunity to meet with graduate students of color, of introducing a strong prospective faculty member of color to the "right" colleague, of personally reaching out to potential candidates that he felt would make great colleagues, and of identifying rising scholars that he would later pitch to the dean as candidates for a lecture or special visit to gain exposure. Other faculty members exhibited their agency by creating networks with underrepresented colleagues. In ES, Jeff shared that he would present at community colleges and around the country as an opportunity to expose minoritized students to the work that was happening at Midwestern. His actions as an opportunity agent served in planting the seed for future applicants. Likewise, in ILS, Richard discussed the fact that some of his African American colleagues created a network so they could "spread the word" informally as opportunity arose.

All of these opportunities were possible because the faculty had clear communication from their chair/dean regarding the ultimate goal – finding the *best* scientist in their area that also happened to be underrepresented in their field. Because these behaviors and unexpected outcomes do not repeat, these examples are at best considered serendipitous when they

contribute to the broader organizational goal. However, each unit has made great leaps in the growth of its underrepresented faculty simply by being flexible and empowering faculty as opportunity agents.

Approach 7: Retaining the competitive edge. Leaders in ES, ILS, and Physics have all motivated change in their recruitment and hiring processes by retaining a competitive edge, both amongst their on-campus peers and in their respective disciplines. As a competitive value, chairs and deans that implement this approach are "valu[ing] being aggressive in pursuit of competitiveness" (Cameron et al., 2014, p. 34) for resources, specifically aimed at supporting faculty diversification efforts. As such, these unit leaders are highly attuned to searching for signals within their environment that indicate where resources may be available and how to best compete for them. Therefore, these unit leaders tend to work toward positioning their department/school as stronger in comparison to their on-campus peers or in their disciplines. This is most evident as leaders vie for open faculty lines, post-doctoral fellows, and funding for their units. Therefore, from this perspective, the success of this approach is best measured by meeting the desired outcome – i.e., did the chair garner the open line, did the department/school win an additional post-doctoral fellow. This competitive approach is extremely high-risk and high-reward, and carries "intense levels of pressure to perform" (Cameron et al., 2014, p. 35) on the part of the chair/dean.

In retaining the competitive edge, the leaders of each of the 3 units have exhibited this approach in a unique way. In physics, Matt conveyed a sense of remaining savvy in the game, by recognizing the power that the dean holds, and the need Matt to align with his values with those of the dean. He was clear on this dynamic and functioned within it for the betterment of his department. Rian, in ES, spoke about having to *fight* for open positions, as acquiring a position

from the SAS dean's office was extremely challenging. He also discussed the importance of remaining competitive in the field by ensuring that each search committee had at least 1 content expert and an "authoritative senior faculty" to help guide the work of the committee. Rian's perspective was that, by ensuring this representation on each search committee, the department would retain its competitive edge in the field. Conversely, Mike's competitive edge was much more intentional and strategic in competing for post-doctoral fellow assignments for ILS. He proudly shared that he regularly served on the ILFP selection committee, to gain insight as to what the committee valued and to then help craft any ILS-interested applications accordingly. This strategy has proven to be extremely successful for ILS in garnering more ILFP fellows than the average unit of their size. Furthermore, Mike openly shared that they shamelessly would "troll the waters" to compete for senior hires when the opportunity presented itself.

All of these examples highlight the competition for resources and the strategic positioning of the units by their leaders. These chairs and dean have functioned as boundary-spanning leaders, as Chun and Evans (2015) describe, in negotiating and competing for resources. They recognize that their impact is dependent upon their ability to "negotiate change within the complexities of the administrative hierarchy" (Chun & Evans, 2015, p. 9). Therefore, even though Midwestern is committing resources to faculty diversification efforts, the resources are still limited, thus requiring the leaders of units that are truly committed to attracting more underrepresented faculty to compete for these resources.

Approach 8: Leveraging positionality for change. Both Chemistry and ES chairs have leveraged their positionality in a similar and distinct manner to motivate change in their departments. This approach is unique in itself, as it arose from exhibited behaviors and values in 2 separate quadrants – collaborate and routine. Whereas the previous 7 approaches were

identified through the values and behavior of 1 quadrant, this one differed. Since chairs highly influence critical organizational areas, such as the departmental climate, recruitment and hiring of diverse faculty, and retention of minoritized tenure track faculty, they must leverage the respect and positionality they garner in their department and field to mobilize and guide faculty toward change (Chun & Evans, 2015). Both Diana and Esther each implemented this approach in order to achieve their desired outcome; however, the outcomes were different.

In Chemistry, Diana leveraged her positionality to develop the buy-in she needed to mobilize her colleagues toward change. To do so, she relied on the respect that she garnered through her positionality as a renowned chemist to guide her colleagues toward change. Consequently, Diana was able to help build cohesion amongst the faculty and gain buy-in on the necessary change processes. Furthermore, by leveraging her positionality in a collaborative manner, she became a catalyst for change within her unit (and later throughout the university) in adjusting their faculty-search processes to align with the CEDE recommendations.

Conversely, Esther leveraged her positionality to create routines in ES from the inception of the department's status. She leveraged her positionality as chair to create a more equitable environment, especially for women faculty. As chair, Esther recognized the power of her role in instilling organizational values, relying on her positionality to develop routines and expectations grounded in her own personal values for equity and diversity. Moreover, she leveraged her positionality during the hiring process by coaching each woman candidate who was offered a position to ask for equitable pay (to their men counterparts), and assured them that she would support them in achieving success. It was through Esther's daily interactions and embedded expectations that she was able to leverage her positionality as chair to create new routines for ES regarding diversity and equity.

While both Diana and Esther successfully leveraged their positionality, in the field and in their role as chair, for varied reasons, this approach allowed them to motivate their units toward change. As each woman recognized that her role as chair was to guide her unit, she also served as a boundary-spanning leader between the departments, the university, and the field, in setting the tone for diversity, and also in "lead[ing], stimulat[ing], and even spearhead[ing] change efforts" through collaborative behaviors (Chun & Evans, 2015 p. 8). In garnering the buy-in and establishing the routines that were needed for change, they each modeled exemplar behaviors of shared governance, by creating networks and balancing the power dynamics (Kezar, 2012), especially those present in diversity work, and by seeking coalition-building opportunities. Both Diana and Esther have been touted for their exemplary leadership skills and their work in diversifying their fields, thus providing evidence that by leveraging their positionality for varied purposes they were able to motivate and mobile their departments toward change.

Food for Thought: Beyond the Scope of *This* Study

As is common with qualitative inquiries, additional insights developed from the data in the interviews that could provide further interesting perspectives for successful approaches for STEM units working to attract more women faculty and/or faculty of color.

Approaches at Varying Levels

While the research questions for this study focused primarily on the role of leadership (i.e., chairs and deans) in motivating change, it limited the type of approaches that were garnered from the data. As previously mentioned in this chapter, the data were also coded for organizational-level and values-level approaches. Appendix F illustrates the plotted findings from this coding process, thus indicating that variation in approaches does transpire at each of

these levels for each unit. The most interesting insight is in looking at the finding for the diversity ethos of each unit (i.e., values-level approaches), where there is a significant shift in values from the leadership approaches. In the diversity-ethos approaches, the data point to a more dispersed representation amongst the 4 quadrants and even a significant pull toward the *competition* quadrant for some units. Further analysis of these additional levels could provide insights into approaches for change in working to attract a more compositionally diverse faculty.

Tensions within the Units

While all 5 units in this study have been recognized at Midwestern for their leadership on campus in working toward attracting more women faculty and/or faculty of color, not all constituents within the units agree with the processes for achieving these goals. As is to be expected with any change process, not all members are ever completely on board with the efforts. Interestingly, the data point to several departments (including AS, ES, and physics) that are experiencing tensions within their departments, in spite of the success they are seeing in their efforts. Much of the tension appears to be stemming, not from resistance to the value of diversity, but rather from the processes and approaches that are taken to hire more underrepresented faculty. For example, some units are receiving resistance from diversity-worker faculty that are unhappy with increasing the number of minoritized faculty through the post-doctoral fellows programs only. Other departments are experiencing tension from the process by which some minoritized faculty were hired. They may like the new scholars and agree that they are competent, but be unhappy with the hiring process for these given candidates. Other examples of tension within the units arose throughout the data during the coding process. These data points would be intriguing to investigate when considering the *success* of a given strategy or

approach. Also, looking further into these data may provide some disconfirming evidence that may have gone overlooked if they did not fit the coding criteria, as specified for this study.

Impact of Minoritized Faculty in Leadership Roles

As noted in the individual case studies, chemistry, ES, and ILS all had leaders with minoritized social identities that many interview participants either spoke to or mentioned very briefly, but that had an impact on their role. Diana, Esther, and Richard (respectively) had significant impacts in the success of their units in recruiting and hiring minoritized faculty. While it was mentioned that it was important that Diana and Esther were women in their chair positions, and that Richard was African American in his informal (and later formal) leadership roles, the participants did not speak at length to the impact of these identities. In a future study, it would be interesting to better understand the impact of these social identities with their leadership roles on their ability to recruit more minoritized faculty. Suggestions of this impact are present in the data, but since social identity was not a primary question in the interview protocol, sufficient data were not gathered to determine the significance of having a leader who is a woman and/or person of color on the overall goal of diversifying the faculty. In this case, more data are needed.

Summary

This chapter presented the findings from the qualitative analyses of this study. More specifically, it provides a comparative case study analysis of the 5 units in this study that are working to attract more women faculty and/or faculty of color. In doing so, as is required of comparative case study analyses, this chapter was preceded with 5 “within-case analyses” (discussed in Chapters VI through X), and this chapter presented the “cross-case analysis”

(Merriam, 2009, p. 204). The results highlighted in this chapter contribute directly to answering the research sub-question: *What have STEM deans and/or department chairs done to motivate change in recruitment and hiring practices?* Based on the evidence provided in this chapter, STEM deans and/or department chairs can be seen to rely mainly on 8 leadership approaches to motivate change: instilling a disciplinary-based framing to motivate change, focusing on organizational climate, cultivating relationships, formalizing diversity practices, grounding routines in expertise, empowering faculty as opportunity agents, retaining the competitive edge, and leveraging positionality for change.

The findings in this chapter – XI (Comparative Case Study) – are paired with the findings in Chapter IV (Quantitative Results), for a robust discussion of the mixed findings in response to the overall research question of this study and of implications for practice and future research presented in Chapters XII and XIII. The comparative case study presented toward the end of this chapter serves as a preliminary discussion to be integrated with those presented in the upcoming chapter, in an effort to better understand the approaches that STEM deans and department chairs take to attract more women faculty and/or faculty of color.

Chapter XII: Discussion and Implications

Overview

This chapter will present an analysis of the combined qualitative and quantitative findings conducted in this study. To do so, the discussion will be situated in the context of the research questions framing this study. The overall research question is: *What approaches do STEM departments take that are working to attract more women faculty and/or faculty of color than do their disciplinary counterparts?* The two sub-questions that guided this broader inquiry are 1) *Does the wording of job postings affect the composition of the applicant pool, and hiring, in STEM departments;* and 2) *What have STEM deans and/or department chairs done to motivate change in recruitment and hiring practices*?

Overall the qualitative results shared in Chapters V through XI provided context for understanding both the role of leadership in motivating change and the types of approaches implemented by STEM units that have been working toward positive deviance in faculty diversification efforts. As noted in these chapters, the Competing Values Framework (CVF) was leveraged to better understand how organizational routines were operationalized in the faculty recruitment and hiring process. Alternatively, the quantitative results presented in Chapter IV provided a prototype for understanding several significant indicators in developing a more diverse applicant pool, and woman and/or faculty of color hire, through the job posting stage of the recruitment process. Noteworthily, the job posting is simply one step in the overall recruitment and hiring process, thus allowing a narrowed investigation of

one perspective related to the entire search process. Therefore, the significance of these quantitative findings (i.e., job posting indicators) will be integrated into the discussion of the overall study as applicable to the approaches taken and distinct stages of the recruitment and hiring process throughout this chapter.

This chapter includes two major sections: approaches to faculty diversification in STEM, and recommendations for praxis. The first section will present the 3 thematic approaches that STEM units (i.e., departments/schools) are taking to attract more women faculty and/or faculty of color. The second section will provide a set of 6 praxis recommendations, grounded in the findings of this study, as key approaches for success in working to attract more underrepresented faculty into STEM units.

Approaches to Faculty Diversification in STEM

The quantitative findings firmly support the philosophy that work on enhancing the compositional diversity of STEM faculty is deeply needed and still in progress, even for the units that participated in the study. Not only do the findings point to STEM departments/schools as significantly less likely to develop diverse applicant pools and hire women and/or people of color for their tenure-track positions, the results indicate that more progress was made as the years passed between 2010-2016. These findings are evidence that while progress was made, substantial effort in faculty recruitment and hiring for equity is still necessary. Furthermore, the analytic models were limited to the data available, thus controlling how robust the analyses could be. Through continued organizational efforts and inclusion of more variables, the findings presented in this study would point to stronger implications and unequivocal recommendations.

While the quantitative data pointed to several significant indicators in the job posting for Midwestern overall, the research question for this study allowed for a broader investigation into

unique cases on campus that were working toward positive deviance (Lavine, 2012) in STEM faculty diversity recruitment and hiring. The integrated results from the qualitative and quantitative analyses point to 3 main themes in approaches that STEM departments/schools are taking to attract more women faculty and/or faculty of color. The following sub-sections will discuss these themes: *necessary leadership, the process – recruiting and hiring,* and *organizational climate*. Moreover, Figure 13 illustrates the mapping of the various approaches (discussed in the themes below) according to the CVF quadrant aspects.

Necessary Leadership to Motivate Change

On university campuses, where academic units are at the core of actuating the campus mission, the role of the department/school leader is critical. As Chun and Evans (2015) argue, the department chair is the most influential person in each academic unit, as that person sets the tone for the organizational environment, implements disciplinary and university values within the unit, and, most importantly in the case of this study, motivates and spearheads change efforts. With this type of positional power, it is understandable how a variable such as "department" is a significant indicator in developing a more diverse applicant pool, as the chair's actions and displayed values are symbolic of the department's changing values. Therefore, the differentiation between departments/schools is important in understanding the variation in units that are making gains in this work. However, it is not the positionality alone of the chair (and dean, in the case of this study) that motivates the change toward positive deviance (Lavine, 2012); there are significant behaviors and characteristics of a strong chair/dean in leading change efforts for diversity, especially in faculty hiring.

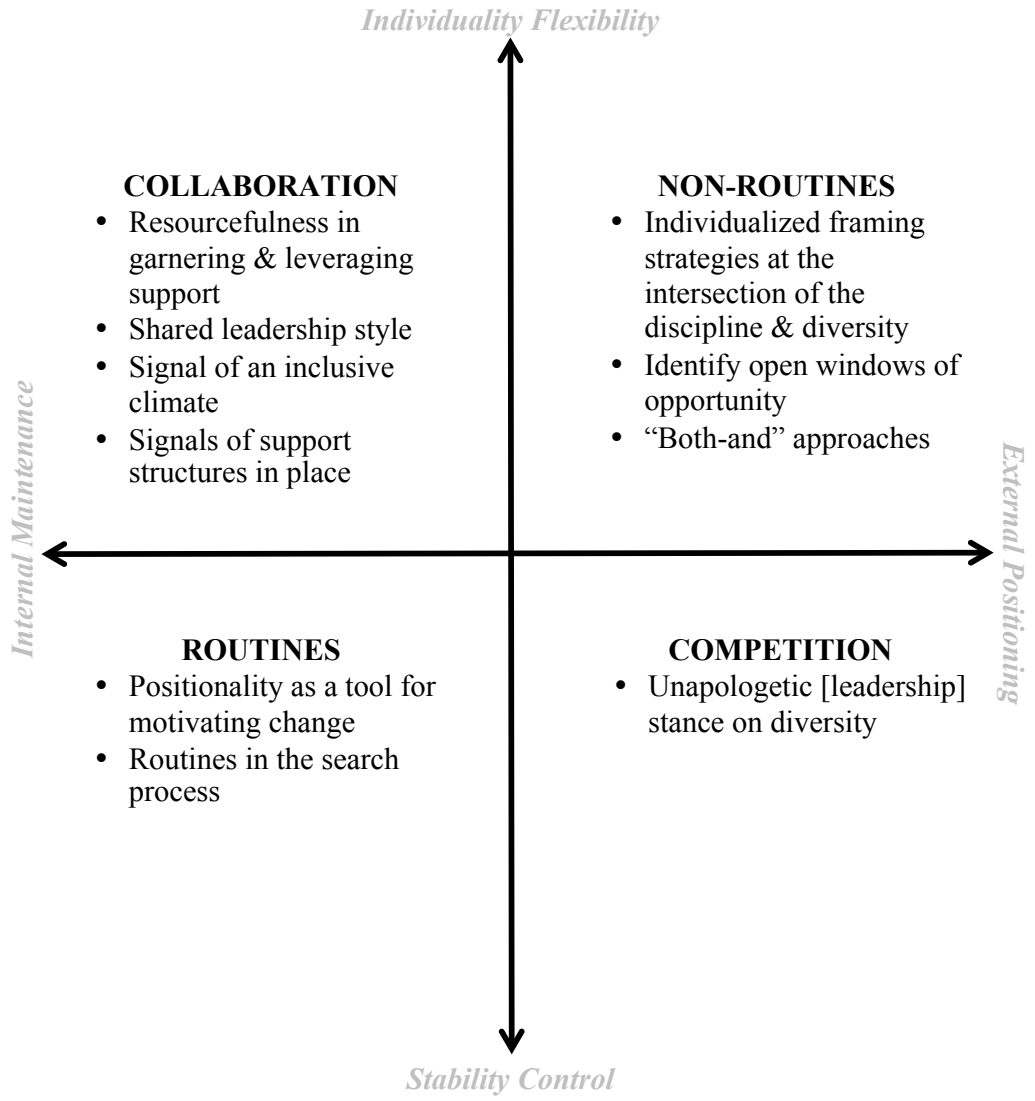


Figure 13. Effective Approaches to Attract More Women Faculty and/or Faculty of Color in STEM Mapped onto the Competing Values Framework

Unapologetic stance on diversity. As leaders of their academic units needing to mobilize their colleagues toward change (Chun & Evans, 2012), the chairs/deans must communicate clearly and boldly the direction for the unit. When considering work on diversity, chairs/deans must be unapologetic in their messages regarding the value of diversity, even when

it is contested, and be willing to name the oppressive systems at play (i.e., racism, sexism) in order to fully address the issue (Ahmed, 2012). As Bensimon (2005, 2010) argues, when conducting difficult work on diversity, we must be willing to allow the invisible to become visible, and the *undiscussable* to become *discussable*, in order for change to transpire. Thus having chairs/deans that are unapologetic about their values on diversity, and about the direction in which they are leading their unit to enhance the compositional diversity of their faculty, is critical in motivating change.

In this study, Diana in Chemistry and Esther in ES were prime examples of unapologetic chairs championing the change necessary in faculty recruitment and hiring practices. They each, individually and in their own departments, took every opportunity to voice and integrate diversity into all areas of their units. There was never a question as to where either of these leaders stood on issues of diversity, and their colleagues had a clear vision of the expectations around diversity from each of them. Much of their strength in boldly naming the inequities and need for change derived from pausing to reflect on their troubled histories (especially for women faculty) and they were both willing to name the problem at hand (Ahmed, 2012).

With such clear vision and expectations from the chairs, both ES and Chemistry were able to successfully conduct faculty searches because they knew the type of faculty member they were aiming to hire. Both Diana and Esther were clear in their values that the work of their departments was to recruit and hire the best scientist in their discipline that also happened to enhance the compositional diversity of their faculty. This clarity allowed the faculty search committees to move forward with clear expectations and work toward this common goal, which, as Delgado-Romero and colleagues (2007) stipulated in their study, is one of the keys to successfully hiring faculty of color. Thus, as the data indicate, chairs/deans who are unapologetic

regarding their values around diversity are key to successfully attracting more women faculty and/or faculty of color.

Implementation of a frame for change at the intersection of academic discipline and diversity. With the fundamental challenge of guiding rather than directing that all academic leaders face in mobilizing their colleagues toward change (Chun & Evans, 2015), chairs/deans must not only be deeply vested in the values of diversity, but also must be persuasive in leading their units with the least amount of resistance. The power of persuasion is perhaps one of the most important tools that a chair/dean can leverage in motivating change. Thus, in dealing with issues regarding diversity, where systems of exclusion have been pervasive such as in the faculty hiring process, the chair/dean must be especially strategic and convincing in order to motivate change.

The chairs of ES and Chemistry, Diana and Esther (respectively), and the deans of ILS, Mike and Liz, all imposed a need for change based on an aligned perspective at the intersection of their discipline and diversity. Knowing that chemists are experimentalists by nature, Diana framed the change process as an *experiment* for the chemistry department to test. Esther leveraged the history of environmentalism in biodiversity as a natural connector in helping her colleagues understand how conducting work on diversity in the workplace was innate to their work as environmentalists. Similarly, Mike and Liz focused on connecting the mission of information scientists, which is to create universal access of information and resources, to the need to have a diverse faculty in order to better understand the best strategies for ensuring this mission. By thus intertwining the value of and need for diversity with the ways and reasons the faculty conduct their research, the chairs/deans were able to successfully motivate their colleagues toward change with minimal resistance, thus providing evidence of the importance of

finding and communicating a strong framing for the work to attract more women faculty and/or faculty of color at the intersection of academic disciplines and diversity.

Resourceful in garnering and leveraging support. While chairs/deans function as boundary-spanning leaders between their units and the university (Chun & Evans, 2015), they must learn to be resourceful in order to support the change efforts they are leading within their units. This is especially important when creating change around diversity efforts, as campus and departmental resources are often quite limited. On a campus such as Midwestern, where diversity is a central focus, additional resources have been dedicated toward enhancing the compositional diversity of the faculty throughout the university. However, when considering the large size of the campus, it is understandable how even those resources that have been dedicated to faculty diversification efforts (i.e., ILFP, MTFP) are still very limited. These limited resources require that chairs/deans become strategic in garnering and leveraging any support available to their units.

The data point to resourcefulness as a critical characteristic of chairs/deans who are working on faculty diversification efforts in 2 distinct manners: in attaining support from content experts and in competitively remaining strategic to garner more physical resources. For example, Diana in Chemistry and Esther in ES both had the humility to recognize their lack of expertise in diversity faculty hiring, and sought the campus-wide experts for their assistance in motivating change within their departments. In alignment with the work on campus racial climate that underscores the value of varied campus dimensions, including organizational history (Hurtado et al., 1998; Milem et al, 2005), Diana and Esther acknowledged their troubled histories with inequity in order to create a path forward. In doing so, each of these chairs recognized that her content expertise was in her scientific area, and acknowledged that she could learn from

diversity-hiring content experts on how to improve her practices. This reflective humility on the part of Diana and Esther, followed by seeking the necessary resources, was key to their success.

Furthermore, Mike in ILS and Matt in Physics exemplified the importance of remaining savvy in the game of garnering resources for their respective units. Mike's strategic service on the ILFP selection committee, and Matt's tactical approach to working with the SAS dean's office on creating the most competitive start-up packages for prospective hires are prime examples of their resourceful natures. Each leader remained keenly aware of the limited resources on campus and was intentional in garnering as many resources as possible to motivate change within his unit.

Shared leadership style. In guiding the work of academic colleagues to create change in systems and processes (Chun & Evans, 2015), the behavioral approach is equally as important as the tactical approach. The data point to the significance of collaborative leadership styles, also exemplified through shared leadership strategies, such as support and acknowledging change agents (Kezar, 2012). The data indicate that a shared leadership style is most productive in motivating change for faculty diversification efforts by balancing power dynamics and by empowering opportunity agents.

Through a shared leadership strategy, both Marc in AS and Diana in Chemistry guided their colleagues through challenging conversations and decision-making processes about diversity while privileging the value of all voices. Marc implemented what he referred to as the "Supreme Court Rules" to ensure that all faculty, regardless of seniority in the department, would have an opportunity to voice their perspectives. Diana led with a similarly strong yet less structured style, encouraging all perspectives – pro and con – as decisions were made. Both of

these chairs gained significant traction in motivating their colleagues toward change through this strategy.

Moreover, in the spirit of shared leadership, the chairs/deans of all 3 units – AS, ES, and ILS – empowered their faculty to serve as leadership partners in diversifying the faculty. They did so primarily by empowering the faculty to serve as opportunity agents, who recruit prospective faculty on a daily basis and through unconventional processes. These non-routine practices (Feldman, 2000, 2003; Cameron et al., 2014) also allowed units to develop more diverse applicant pools during traditional open hires. In this respect, it is understandable that the variable "extension status" (in the quantitative analysis) is a significant indicator for developing a more diverse applicant pool, as the length of time a position is posted increases the amount of time that opportunity agents (and others) have to encourage more women and/or people of color to apply for the open positions. Therefore, while it may appear that time is the significant indicator in the analysis, the qualitative data point to background behaviors that may be influencing the impact of this variable, such as the influence of opportunity agents.

It is thus clear that through shared leadership styles, chairs/deans are able to motivate their colleagues to create change in the recruitment and hiring process. More specifically, through collaborative leadership styles, leaders are able to guide and level power dynamics that may develop within departments (Kezar, 2002). Furthermore, by empowering opportunity agents to recruit daily as a proven success strategy, especially for faculty of color (Olivas, 1988) and in support of diversity-worker (Ahmed, 2012) faculty, units will not miss opportunities that may be present through a traditional, structured process.

Positionality as a tool for motivating change. Positionality, founded in both social identities and in positional power, is critical to the functionality and success of a chair/dean in

guiding change efforts (Chun & Evans, 2015). As Kezar (2000) posits, positionality is distinctly defined by one's own overlapping identities (inclusive of race/ethnicity, gender, sexual orientation, social class) and is co-constructed by one's power – which is a force that is permeated by context, historical situations, and relationships. It is the power embedded within the positionality of a chair/dean that allows that person to guide departments/schools with or without efficiency. As a co-constructed social force, positionality is also deeply impacted by the respect in which a chair/dean is held by colleagues (Chun & Evans, 2015) in motivating change in diversity-related work. This is why successful leaders working to create change in diversity efforts, such as attracting more women faculty and faculty of color in STEM, leverage their positionality as a tool in motivating change.

In both Chemistry and ES, Diana and Esther leveraged the positionality they held as women chairs of STEM departments and as exceptional scientists in their fields who were deeply respected by their colleagues. . Their social identities impacted their values on diversity and provided them an acute perspective from which to analyze the work necessary to increasing gender equity amongst their faculty. Furthermore, they leveraged the positional power embedded within their leadership roles as chairs to help mobilize their faculty (Chun & Evans, 2015). As chairs, their positional power afforded them influence over areas including departmental climate, recruitment and hiring of diverse faculty, and retention of underrepresented junior faculty (Chun & Evans, 2015). Although chairs have a broader reach of influence than these 3 areas, the data from this study primarily focused on these dimensions, as they are most relevant to the departmental goals of enhancing the compositional diversity of the faculty.

The Search Process: A Spotlight on Recruitment and Hiring

In working toward understanding successful approaches of STEM departments/schools working to attract more underrepresented faculty, it is helpful to consider approaches directly related to the recruitment and hiring process. The data, both quantitative and qualitative results, point to significant indicators within the search process that are critical to attracting a more compositionally diverse applicant pool and potential faculty. The collective data emphasize 3 major aspects that influence a successful recruitment and hiring process for STEM units working to attract more compositionally diverse faculty: routinizing the search process, finding open windows of opportunity in the search process, and integrating *both* traditional hiring *and* non-traditional opportunities.

Routines in the search process. While the hiring process may seem like an embedded routine on all campuses, with patterns of repeated behaviors developed to achieve a designated goal (Becker, 2004), quite a bit of flexibility is actually integrated into the process to allow for contextual adjustments. This flexibility, however, can lead to a lack of structure in the search process that can create weaknesses and increased opportunities for unconscious bias (Stewart et al., 2007). Scholars have encouraged the use of routines to minimize bias in the recruitment and hiring process, especially when working to attract more women faculty and/or faculty of color (Smith et al., 2004; Stewart et al., 2004, 2007).

Although AS and ILS have both moved toward routinizing all of their hiring opportunities – both traditional open hires and post-doctoral fellowship opportunities – ILS is the exemplar case on benefitting from formalizing all hiring practices for diversity. As was noted in the ILS case study in Chapter VIII, the deans have a search-process document that clearly stipulates all of the expectations and steps each committee must follow. This document states

expectations for all stages of the recruitment and hiring process, including: job-posting language, job-posting advertising sites, diversity plan for the entire search process, deliberately outlined (as designated by the committee) application-review criteria, campus visit, and interview protocol that includes who the prospective faculty member will meet with individually during the campus visit. Not only are these stages designated, but there are also routines for the selection of the committee, and the chair of the committee is handpicked for the role. Furthermore, throughout the process there are embedded support staff and administration that are set to meet with the committee chair to review progress and provide support if the committee is not meeting expectations or has concerns. This level of routinizing has allowed ILS leadership to improve control of the process and ensure that diversity goals are met. Moreover, this process is mirrored for any post-doctoral fellowship opportunities, in spite of the university not requiring it.

With job-posting language as one component of the recruitment process, the quantitative analysis for the presence of any diversity statements in the job posting is a significant indicator of a diverse hire. This is a reflection of departments/schools that are heeding the recommendations of campus experts (i.e., DTG, CEDE) and intentionally including diversity language in their job postings. The inclusion of the diversity statement is a reflection of the unit's intention and desire to diversify its faculty, thus connoting that the value for diversity may be integrated in other components of the recruitment and hiring process that are not measured through this study. However, the inclusion of a diversity-related statement in the job posting may represent the value a unit places on diversity.

Furthermore, the data indicate that routines that are grounded in expertise, as they were for Chemistry and Physics, allow the leaders to motivate their faculty toward change. Much of the expertise that was disseminated through DTG and CEDE provided empirical evidence

supporting routines regarding requiring bias training, creating diversity plans, advertising plans, clearly defining selection criteria, and formalizing interview questions (Stewart et al., 2004, 2007). This was in addition to the firm recommendations on job-posting language and the importance of committee-member selection (Smith et al., 2004; Stewart et al., 2004, 2007).

It is plausible that the significant results from both variables "year" and "job title" as indicators in the development of a more diverse applicant pool could be a result of the development of more routines (and the incorporation of DTG and CEDE recommendations into recruitment and hiring routines) across STEM units at Midwestern. Therefore, each year more STEM units could have begun incorporating these DTG and CEDE recommendations into their search practices, thus impacting the lower-rank tenure track positions ("assistant professor") most prominently as the most frequent "job title" posting. In addition, as STEM departments also work to diversify their graduate student populations (Posselt, Porter, & Kamimura, 2018; Posselt, Reyes, Slay, Kamimura & Porter, 2017; Slay, Reyes, & Posselt, 2018), it is clear that the largest portion of women and people of color are applying to assistant professor-titled positions rather than to senior-ranked faculty positions.

As the results (both qualitative and quantitative) point to, routines in the recruitment and hiring processes have been implemented as an approach to motivate departments/schools toward change.

Identification of open windows of opportunity in the search process. Although many STEM departments/schools may feel as though their "hands are tied" due to legal restrictions and even strictly regulated processes for hiring on campuses, finding open windows in the process is critical to success. Springer (2002) urges campuses to use the recruiting period to develop diverse applicant pools and to work to openly recruit with language directed at underrepresented

applicants, as this is not prohibited by law. DTG and CEDE have worked to educate Midwestern faculty as to where these windows of opportunity occur. The CEDE training teaches faculty that once the offer is made to a prospective hire, then the process returns to the recruiting stage, where leveraging social identities and addressing issues related to social identities is no longer restricted by the law (Stewart et al., 2007). Thus, STEM departments that are working to attract more women faculty and/or faculty of color recognize that the search process is a cycle of recruit-hire-recruit, where race/ethnicity and gender can be positively targeted as windows of opportunity.

Physics was an exemplar in heeding the advice of DTG and capitalizing on *recruitment* as a window of opportunity throughout the process. Jack, a long-time faculty member, spoke to how the CEDE training had impacted the department and taught faculty to "make the offer" so they can exit the search process (i.e., the evaluation period) and re-enter the recruitment phase, where the legal restrictions are no longer applicable. By implementing the recommendations of the on-campus experts in CEDE, Physics has thus capitalized on the flexibility available within the recruitment window to attract more women faculty and/or faculty of color.

Integration of both traditional hiring and non-traditional opportunities. Frequently, campuses and departments/schools feel as though their "hands are tied" because they view their opportunities for hiring using a very narrow paradigm. However, the data in this study highlight the STEM units that took full advantage of all opportunities. While the narrow paradigm considers openings for diversity hiring to be either through opportunity-hires (i.e., specially-funded faculty positions specifically for underrepresented faculty and/or those studying areas related to diversity) or traditional open hires, a broadened view considers a "both-and"

perspective, where seeking and hiring through both traditional and non-traditional processes creates the greatest success.

In this study, ILS best captures this approach in motivating their faculty toward change. ILS deans are placing equal attention on open searches and on the ILFP post-doctoral opportunities. While this is a unique unit, in which faculty recruitment and hiring transpire at the school-wide level versus the departmental level, Mike (the dean) has a significant amount of positional power in designating the number of open searches the unit will be conducting per year. Additionally, though, he ensures that ILS continues to compete for on-campus resources to supplement the traditional hiring models. Moreover, as discussed earlier, since ILS values the non-traditional opportunities as much as the traditional open lines, it has moved toward routinizing both hiring processes by ensuring the processes mirror each other. As noted by the ILS deans and faculty, the unit has been increasingly successful at growing the number of faculty members, and most importantly at increasing the number of faculty members of color in particular, by leveraging both types of opportunities concurrently.

With it "both-and" perspective, the Competing Values Framework (CVF) exposes how leaders make decisions for change based on opportunities and challenges at hand (Cameron et al., 2014). The CVF illustrates how multiple concurrent approaches can lead to the highest level of success, depending on the desired goal and the organizational context. In this study, ILS capitalizes on both routines and non-routines opportunities to leap forward in attracting more underrepresented faculty.

Daily Recruitment: Focusing on Organizational Climate

While many STEM faculty members may claim that the low numbers of women and people of color in graduate programs is at the core of the inequity of not being able to hire more

women and/or people of color into faculty positions , itmust also be acknowledgedthat poor organizational climate also leads to high levels of attrition, especially amongst minoritized faculty (Greene & Stockard, 2010; Griffin et al., 2011a,b; Smith et al., 2006). These high levels of attrition create the "revolving door" syndrome (Moreno et al., 2006) that at best leaves departments/ schools with an even number of underrepresented faculty even when they are working to attract more. The data (both qualitative and quantitative) provide evidence for the impact of positive organizational climate – and working on developing a more inclusive and supportive climate for all – on serving as an approach to attract more women faculty and/or faculty of color into STEM. Although several of the other strategies are cyclical in nature (as they are embedded within a specific process, i.e., the search process), this is an approach that requires daily work and attention. The data collectively point to 2 main indicators of a positive organizational climate: signals of an inclusive climate and signals of support structures in place.

Signals of an inclusive climate. When women and people of color have continued to feel marginalized throughout their educational process in STEM due to the low numbers of other minoritized students and faculty, it is reasonable to consider that they will look for signals (both formal and subtle) of an inclusive climate. As noted in the data, there are several units that have focused on developing a more inclusive and healthy climate for all, while also recognizing that this positive climate serves as a recruitment tool. The signals noted in this study vary between physical environmental signals, to notable higher retention of women faculty and/or faculty of color, and transparency of processes.

AS and chemistry have committed to the physical environmental markers that can signal an inclusive climate to a prospective faculty member. . As Marc in AS shared, they have purposefully worked to change the art on the walls, to create a gender-neutral restroom, and to

develop stickers and t-shirts that all members of the department wear and post, proudly displaying their diversity values. In Chemistry, Diana shared that the faculty display markers of work-life balance, many of which were noted during the interviews, including children's art, photos of family, and even exercise machines in their offices. In Chemistry, the faculty also have developed a cultural norm of bringing their children to co-curricular and recruitment activities, including graduate-student recruitment days and faculty-recruitment socials, to encourage an inclusive environment but also to exemplify that work-life balance is a goal for this department. Regardless of the directness or subtlety of these signals, aboth are noticeable to prospective faculty as markers of an inclusive climate.

Several of the units – AS, Chemistry, ILS, and Physics – all spoke to their retention strategies to support the success of their junior faculty. Many of these approaches include providing these faculty members with mentoring, funding to support their research, cohort models for junior faculty to create support networks, and highlighting their research as valuable contributions to the department/school whenever possible. All of these units spoke to the role of these strategies in increasing retention, especially of their women faculty and faculty of color, which has helped many of them heal from troubled histories with attrition of these populations and also has helped stop the revolving-door syndrome they once experienced (Moreno et al., 2006). The faculty and leadership in all of the units commented that the higher retention of women faculty and faculty of color is one of the most important indicators for attracting more underrepresented prospective hires, as these prospective faculty can see that other faculty like them are supported and successful.

Chemistry has a unique approach that signals an inclusive climate. In response to the unit's tainted history, Diana mobilized the faculty to develop more transparency in all policies in

an effort to create more inclusivity and encourage stronger success overall. This began with creating more transparency in the tenure and promotion process, which happened just before Diana became chair, but she leveraged that policy change to develop clear expectations in all other departmental policies also. The transparency that is now present in Chemistry not only continues to support the success of the entire faculty, but also signals that support for all is embedded in the department.

When considering this set of tangible signals of an inclusive departmental/school-wide climate that a prospective faculty member might note, it is reasonable to see how "Statement B" – indicating that the university is supportive of dual career couples – is a significant indicator of developing a more diverse applicant pool. Based on the qualitative data that indicate that these tangible signals of an inclusive climate are critical for recruitment of women faculty and faculty of color, the presence of "Statement B" in the job posting is indeed supported as a recruitment approach in attracting a more diverse pool. Even for applicants who do not have partners (at the time of application), it is a tangible signal that the unit supports the applicant as a whole person, not just that person's scientific contributions.

Signals of support structures in place. Where the set of signals just discussed is of tangible markers of an inclusive climate, there is another set of intangible and behavioral markers of support structures that create an inclusive climate. These support structures primarily include enhanced mentoring by the chair, balancing of power dynamics within the department, and supporting a highly relational work environment. Not only do these signals assist with recruitment of a more compositionally diverse faculty, but they also ameliorate the negative climates that many marginalized faculty members experience in their units (Greene & Stockard, 2010; Griffin et al., 2011a,b; Moreno et al., 2006; Smith et al., 2006).

Marie – a recently tenured physics faculty member – shared the value of mentoring from the chair and senior faculty to junior faculty members' success and sense of belonging in the department. Both she and the chair, Matt, indicated that the mentoring has significantly impacted the success of all junior faculty members, but also has helped with retention of underrepresented faculty, which in their opinion now serves as a self-generating engine for recruitment of other women faculty and faculty of color. Conversely, in AS, Marc (the chair) has worked to equalize the power of all voices during meetings to ensure that junior faculty are not overlooked or silenced by senior faculty in the room. He has done so by implementing the "Supreme Court Rules," which have allowed him to ensure that the voices of women and people of color – which are more represented in the junior ranks – are included. This leveling of power in AS has tremendously impacted the sense of inclusion in the department, thus serving as a signal to prospective faculty of a workplace where they too can be valued.

ILS deans have fostered an inclusive climate through their highly relational culture. The data include many examples indicating that relationships are central to their inclusive climate. Richard and Mike both confirmed that their close relationship allows Richard to serve as a mentor to junior faculty of color and to ensure that diversity-related issues are addressed. In addition, Mike and the other deans empower their faculty members to serve daily as opportunity agents that foster relationships through outside networks to recruit nationally. Furthermore, Richard is empowered by the support that he receives in his own relationships with the deans to support and speak openly to prospective hires about the climate in ILS for faculty of color. His confirmation of the inclusive climate is a self-generating engine that has brought ILS significant success in attracting more faculty of color.

Summary of Approaches

Both quantitative and qualitative evidence in this study underscore the value of 3 primary thematic approaches that STEM departments/schools are taking to attract more women faculty and/or faculty of color. These approaches include: *necessary leadership, the search process – recruiting and hiring,* and *organizational climate*. For necessary leadership to motivate change, there are 5 primary behaviors and characteristics that should be present for success: an unapologetic stance on diversity, implementation of a frame at the intersection of the academic discipline and diversity, resourcefulness in garnering and leveraging support, shared leadership style, and positionality as a tool for motivating change. In the search process, 3 main aspects should be focused on for success: routines in the search process, identification of open windows of opportunity in the process, and integration of *both* traditional hiring *and* non-traditional opportunities. For the daily recruiting that results from an internal focus on organizational climate, 2 key indicators are critical in attracting more women and people of color: (tangible) requires signals of inclusive climate, and (intangible) signals of support structures in place. Collectively, it is evident through the findings of this study that effective recruitment and hiring of more women faculty and/or faculty of color into STEM is facilitated through approaches in all 4 quadrants represented in the CVF.

Recommendations for Praxis

As discussed throughout this study, as a result of several restricting parameters regarding recruitment and hiring practices – inclusive of the law and campus-based policies and norms – campuses, schools, and departments may feel as though their "hands are tied." Grounded in the empirical findings from this study, I would like to offer some insights to department chairs and/or school deans who would like to work toward "untying [their] hands." In doing so, I offer

8 recommendations[27] for praxis to department/school leaders who would like to motivate their units to change toward enhanced compositional diversity of their faculty.

Find a framing that intertwines the discipline with the values of diversity.

The leader of an academic unit (i.e., chair, dean) has the positional power to set the tone for change (Chun & Evans, 2015). With that in mind, when working on issues of diversity – especially faculty diversification – that can be met with resistance by some constituents, provide framing for the importance of the work that is at the intersection of your academic discipline and diversity. This will allow the faculty to better understand the need for diversity and also the ways in which they can most comfortably contribute to the work. When in doubt, remember Diana in Chemistry framing the need for change in recruitment and hiring practices as "an experiment," because after all, chemists are experimentalists at heart.

Seek "both-and" opportunities.

While resources are often scarce on campuses and within schools and departments, do not allow that to limit how opportunities are conceptualized. As boundary-spanning leaders (Chun & Evans, 2015), chairs have the ability and responsibility to remain resourceful for the benefit of their departments. In this light, look for enhanced opportunities in all spaces. Remember that successful recruitment and hiring for enhanced compositional diversity of faculty is a "both-and" strategy, not an "either-or." If you receive one opportunity, an open line for example, do not stop seeking non-traditional opportunities as well. If your campus does not offer additional hiring opportunities, such as post-doctoral fellows or diversity opportunity hires, remain strategic in looking off-campus, even nationally, for some of these options to expand your windows of

[27] These approaches are purposefully not numbered as they are all equally important in working toward equity.

opportunity. When looking for inspiration, think of Mike in ILS as he focused on allocating open lines *and* remaining competitive for the ILFP hires.

Seek support from content experts, and leverage recommendations.

Often times, academe does not encourage humility; instead it encourages the touting of expertise nationally and even internationally. However, as leaders of units, recalling that expertise has limitations, and no one person can be an expert in all areas. It is important to have the humility to recognize that as a chair/dean of a STEM unit and renowned scientist in your given field, you may not be trained to be an expert in diversity hiring practice; but others are. Therefore, recognizing this and seeking support is critical to implementing the best strategies to attract more women faculty and/or faculty of color. Furthermore, as the chair/dean of your unit leverage your positional power to guide faculty (Chun & Evans, 2015) toward implementation of the recommendations from the content experts. Diana in Chemistry and Esther in ES were great examples of understanding their limitations in diversity-hiring practices, and, thus expressing humility in this lack of knowledge, sought the support of the DTG experts, and mobilized their faculty to implement the recommendations.

Communicate clear expectations, process, and structure for faculty recruitment and hiring.

As seen earlier, while structures might exist on your campus for faculty hiring, recognize that there is also quite a bit of ambiguity and room where unconscious bias can creep in. The more clarity regarding expectations and desired outcomes that you, as the unit leader, can provide prior to and during the search process, the higher the probability for success in hiring a woman faculty and/or faculty of color (Delgado-Romero et al., 2007). Aim to create as much structure as possible within and for the search process. Lean heavily on developing routines for as many of the steps within the recruitment and hiring process as possible, and clearly

communicate those expectations. Turn to ILS as an example and to the success it has achieved by routinizing the entire faculty-hiring process (including the post-doctoral hires) in attracting and hiring more faculty of color in particular.

Lead unapologetically in support of diversity.

With little ability to mandate faculty behavior, chairs must instead guide their constituents toward change (Chun & Evans, 2015). However, the literature argues that, when conducting diversity work, leaders must be bold in their stance and help make the unspoken speakable (Ahmed, 2012; Bensimon, 2005, 2010) in order to transform spaces. To that end, the most powerful tool that you, as a chair/dean, have is your voice and stance. In order to successfully guide your faculty toward transformative change that creates equity where inequity prevails, it is critical to lead with an unapologetic voice and perspective regarding diversity. Although diversity may be contested in various spaces, use your voice and positionality to lead your faculty to change. If you seek inspiration in an apologetic leader for diversity, look to Diana in chemistry and Esther in ES, as they both led boldly and fiercely in diversity efforts.

Recognize that recruitment is a daily routine.

While the recruitment and hiring process is a cyclical process that occurs during certain times of the academic year, it can help to remember that recruitment should be a daily process. The power of focusing inward on organizational climate not only provides a healthier, more supportive work environment for current faculty, but also becomes a self-generating recruitment engine for prospective faculty who are looking to those that share similar social identities with them – for signs of being supported. Remember that the recruitment process is also influenced by your national reputation, which is predicated by current faculty experiences. Furthermore, recruitment is a daily process; look for spaces where you and/or your faculty can network with

other underrepresented scholars in your discipline and look for potential future colleagues (Olivas, 1988). AS is a key example of a department that has been focusing on improving its departmental climate as a retention and recruitment strategy. Marc in his capacity as chair, and Stella, as a proactive faculty member, spoke to their intentionality with daily recruiting efforts.

Empower opportunity agents.

Even though diversity may feel like a high-stakes endeavor, and routines are encouraged throughout the process, remembering shared leadership models are critical in guiding faculty (Kezar, 2012). When you lead unapologetically, with clarity of vision and expectations, it facilitates your empowering your faculty to serve as opportunity agents. As noted throughout this study, the work required to create change in diversity requires multi-faceted approaches and cannot (not should not) be conducted as a one-person venture. To this end, empowering your faculty to serve as opportunity agents that look for daily prospects and create unprecedented opportunities for your unit can lead toward exponential progress toward your goal of enhancing the compositional diversity of your faculty. Not only can they help share the burden of the work, but they will also be able to identify unexpected windows of opportunity. If straying from routines feels a bit uncomfortable, look to ILS and the success it has reaped by empowering Richard as an opportunity agent.

Retain a competitive edge.

In diversity work, competition is often viewed as taboo since traditional measures of merit have been used to perpetuate exclusion throughout higher education (DeWelde & Stepnick, 2015; Lemann, 2000; Posselt, 2016; Smith, 2009) and prominently in academe, throughout history. However, reframing conceptualizations of competition within higher education can be transformational. As the chair/dean of your unit, you are charged with leading your area to

"success" (however that be measured) within the parameters of your allocated resources. Therefore, in order to be successful in garnering the resources necessary to create change, you must retain a competitive edge for the benefit of your unit. To do so, you should be savvy about the politics of your campus and school. Look to Matt in physics, who so concisely describes his clear understanding of the dean's power in allocating open lines that he must retain. Also, work strategically to gain access to opportunities on campus and off campus that will provide you stronger insights into how to garner more resources, or how to compete for them more successfully. Look at Mike in ILS and the service that he provides on the ILFP committee to ensure that he has the inside perspective on how to best craft applications for success in gaining more fellowship slots for his school. Competition does not have to be fraught with negativity in education; rather it can represent a strategic edge that must be retained to attain the resources necessary to develop more opportunities to attract and hire a more compositionally diverse faculty.

Summary

This chapter presented an analysis of the results of the combined qualitative and quantitative analyses conducted in this study. The discussion of these findings was aimed at answering the overarching research question of this study: *What approaches do STEM departments or schools take that are working to attract more women faculty and/or faculty of color than do their disciplinary counterparts?* The response to this research question generated by this study is that STEM departments and schools that are working to attract more women faculty and/or faculty of color have implemented 3 primary approaches.

These 3 thematic approaches posited as most influential in attracting more unrepresented faculty are *necessary leadership, the search process,* and *organizational climate*. Based on these approaches and the findings from both quantitative and qualitative analyses, I provide a set of 8 recommendations for STEM unit leaders who are looking for a way to "untie their hands" and identify mechanisms to attract more women faculty and/or faculty of color. The following chapter, Chapter XIII, will provide insights for future consideration focused in research and a conclusion to this mixed methods study.

Chapter XIII: Future Directions

Overview

In this concluding chapter, I leverage the insights gained from this study as a catalyst for considering future research that could flourish from these findings. The closing section of this chapter will present the culminating insights from this mixed methods study, by highlighting the main approaches that STEM departments/schools take that are working to attract more women faculty and/or faculty of color.

Implications for Future Research

Based on the insights gained from this study, there are three main areas of research that emerge from this project. One of the directions for future research focuses on enhanced data collection in providing a *deeper* look into STEM faculty recruitment and hiring (primarily in response to the data limitations faced in this study). A second direction of research considers a *broadening* of the scope of this study to include other STEM units and differentiated campus types working toward positive deviance to gain additional insights on approaches that corroborate the findings from this study, as well as a longitudinal assessment of the approaches influencing STEM faculty hiring. The third thread would investigate the "food for thought" discovery discussed in Chapter XI regarding the impact of social identities of the department/school leader related to the recruitment and hiring process in STEM. This thread of research dives into *personal* attributes of unit leaders as possible influencing factors in the STEM hiring process.

A *Deeper* Look at STEM Approaches to Faculty Diversification

A deeper look into the phenomenon at-hand could include the following three areas: enhanced robust data gathering, varying analytic frameworks, and further investigation of disconfirming evidence. The data in this mixed methods study was so robust in its findings that it naturally pointed to newer areas of inquiry. As such, the following sub-sections describe some of the ways in which the findings from this study can serve as a foundation and be further developed through future research.

Enhanced robust data gathering. Although the data collected in this study was robust and provided for fruitful insights, there were several limitations highlighted in Chapter III that a future study could look to develop. With more time and resources, including a stronger partnership with Human Resources (HR), perhaps additional information could be discovered. Currently HR at Midwestern does not require that all applicants for tenure track/tenured positions to submit a formal application through the university online system. Therefore the data analyzed in this study were limited to those available through HR. However, if the university were to systemically require that all applicants submit applications through the university's online system, more robust data regarding the current variables would be available for a more robust analysis. Thus, with more complete data, findings would be more reliable and indicative of influencing factors for the development of a diverse applicant pool, and person hired, in the job posting.

Furthermore, Midwestern HR does not collect data on search committee composition. In recognizing the critical value of committee composition and the impact of having a diverse committee when working toward diversification in hiring (Smith, 2000; Turner, 2002), enhancing the currently developed dataset with search committee demographic data would be a

significant enhancement to the current dataset. Collecting search committee composition could provide insights into the influence of the following factors on the hiring process: demographic data (inclusive of social identities), positionality within the unit and university, involvement in leadership across campus, engagement in diversity initiatives within the unit and university, attendance and engagement in campus-wide bias training (such as through CEDE and DTG at Midwestern), longevity in the unit and on campus, and number of search committees served on (previously). According to the literature and qualitative data gathered, these search committee variables could deeply impact the direction of a search committee and thus the ultimate recommendation for hire. While HR does not systematically collect these data, I did learn that this information is saved at the departmental/school-wide level and could be gathered independently.

Furthermore, the current HR data system that houses the job posting archives, currently only holds the most recent version of the wording. In the case of positions that have been extended and/or reposted, there may have been adjusted language in the posting, which would be important to consider as a possible indicator. Likewise, currently Midwestern does not have a systematic requirement for all submitted applications. As noted in the job postings and as corroborated through the qualitative data, while HR shared a complete set of applications that they had in their archives, it is evident that many other applications are submitted directly to the departments/schools and therefore not archived in HR. Therefore, gaining access to these additional applications through the hiring units would create a much more robust set of data.

Although I was able to capture a rich perspective from the unit leaders and some faculty, I was not able to triangulate my findings through additional measures, such as observation of the social phenomenon – the recruitment and hiring process – in any of the units that participated in

this study. Observations of faculty hiring processes would provide additional insights regarding many of the behavioral components that arose, and also insights into many of the latent effects that may be influencing the recruitment and hiring process. In addition, analysis of additional text, such as written feedback from search committee members and notes and application data regarding applicants that were pre-screened (or not reviewed by a full search committee) could provide additional insights into faculty hiring.

Finally, similar data (as described above) should be gathered and analyzed for special programs, such as ILFP and MTFP, which highly impact the diversification of the faculty. While these programs can be viewed as non-traditional, the qualitative data point to the high impact of these practices. Therefore, a better understanding of the recruitment and selection process (and the intricacies involved) would shed light on potential new practices. Furthermore, a deeper understanding of these programs could provide insights into understanding the potential for generalized impacts on varying campus types and perhaps on a more national scale.

Varying analytic frameworks. The focus of this study centered on organizational routines as considered through a CVF lens. To investigate the research questions posed in this study, this framework provided a rich set of praxis-based implications and a wide array of insights for future investigations. Much of the qualitative data led me to believe that a primary motivator for change was based in values-informed actions. This is to say that the data spoke to a deeper change that is necessary beyond changing of logistical processes. The data indicated that value shifting is critical for the success of diversity-related work, especially when considering the recruitment and hiring of women faculty and/or faculty of color into STEM. Therefore, future research should consider differentiated theoretical frameworks that would allow for a nuanced investigation of these values-informed actions that are influential to the hiring process.

Moreover, several of the key approaches identified align with positive organizational scholarship. For example, a deeper analysis of what is required to be or become an "unapologetic leader" could uncover leveraging *courage* as a leader. Another example would be the "alignment of their discipline with diversity" and the sense of *creativity* that this may require or foster. As such, a deeper analysis with theoretical frameworks investigating courage and creativity (amongst other positive organizational variables) within the workplace, could lead to new insights in understanding the approaches to enhanced diversification of STEM faculty.

In addition, some of the qualitative data pointed to aspirational aspects in their work on diversity around faculty hiring. Many faculty and leaders interviewed spoke of the direction they were heading, or the work they would like to be doing or should be doing as a unit. This brought up the question regarding *impression management* that may be occurring during the recruitment process (in addition to during the interviews that I conducted). Thus considering *impression management* as a potential theoretical framework under which to analyze the data could provide new insights into the directionality of the work and/or mechanisms that organizations are leveraging to reflect an image they are aspiring for.

Investigation of disconfirming evidence. While the perspective reflected in this study focused on leadership within the STEM units, additional data gathered pointed to approaches at varying levels (including at the organizational-level and the diversity-ethos level). Evidence of these findings were briefly discussed in Chapter XI (under sub-section "Approaches at Varying Levels"), and CVF plots for these findings are available in Appendix F. As was noted through minimal observation of the plotted incidences at these additional levels – organizational and diversity ethos – there is reason to believe that disconfirming evidence that challenges the findings presented in this study are available. This evidence would not disprove the findings

presented in this study; rather it could enhance the diversification of approaches taken by STEM units. Thus a deeper analysis of these data could enhance the overall finding and approaches identified.

Furthermore, as also discussed in Chapter XI (sub-section "Tension within Units"), evidence presented in the qualitative data indicate that discord in the units exists around some of these strategies and/or regarding the unintended consequences of the implemented strategies. A deeper understanding of these tensions would provide insights into the complexities of the approaches implemented, and would help provide a more robust and contextualized set of approaches.

Overall, the next stages of this study should include collection of additional data, consideration of differentiated analytic frameworks, and an investigation into the tensions currently present within the units centered on faculty hiring practices. The objective is to develop a deeper, more robust understanding of the recruitment and hiring approaches of STEM faculty hiring for equity. Since this was the first data request for these types of data from HR in developing the job posting dataset, further work with HR could provide for a more robust quantitative analyses that could potentially lead to additional findings. Moreover, as the first study of this type with these data, additional analytic lenses should be considered. Currently available data should be further investigated for impact.

A *Broader* Look at STEM Approaches to Faculty Diversification

As noted in the design of this study in Chapter III, both quantitative and qualitative data were gathered from one campus and considered from a cross-sectional moment in time. Thus broadening the institutional types, unit types, and considering a longitudinal temporal aspect to this work would help in understanding the generalizability of the identified approaches.

Varying institutional types. While this study provided for depth of understanding of the phenomenon on one campus, expanding the breadth of the study would enhance the applicability on to a broader audience. Midwestern was an ideal campus to investigate in this initial study, as it is a large, public, well-resourced campus that has historically been and continues to be deeply invested in diversity issues. However, these are the attributes that also make Midwestern a unique campus, as most campuses do not have the same capacity nor resources as Midwestern. Therefore, duplicating this study at varying institutional types, such as smaller campuses, private colleges/universities, community colleges, Minority Serving Institutions, and multi-campus system colleges/universities, could point to new approaches. In addition, investigating these same variables and qualitative considerations at varying campuses would provide a better understanding as to which approaches are Midwestern-specific and which approaches are more generalizable. Since context is so critical to the foundation of qualitative work, understanding varying contexts will provide insights regarding the generalizability and specificity of identified approaches. A next stage for this study would be expanding it to more campuses, on a national scale, where evidence of positive deviance is occurring.

Varying unit types. Much like investigating differentiated campus types would shed light on new approaches or corroborate the findings of this study, investigating varying STEM units types (i.e., departments, schools) could provide insights into the diverse approaches that may be needed depending on the unit level at which the hiring is taking place. In addition, the data point to disciplinary influences in the enactment of recruitment and hiring practices. As such, considering a diversity of STEM units varying across natural and physical science, and pure and applied disciplines would broaden the applicability of approaches and understanding of the phenomenon. Therefore, diversification of unit type should be considered for future research.

Longitudinal analysis. This study focused on a cross-sectional quantitative analysis of the influencing variables within the job posting. However, as a national focus on diversity continues, more campuses are working more intentionally on related efforts as each year passes. Therefore, in an effort to better understand some of the latent effects that may be changing over time, an event history analysis of the variables presented (and the additional variables discussed earlier in this section) would provide insights into approaches that have significant influenced the hiring of women faculty and/or faculty of color into STEM over time. With a data set such as the one in this study, temporal aspects are naturally a part of the data, as it contains job posting data over a 10-year period. Therefore with more robust data, a longitudinal analysis could point to significant factors that influence the recruitment and hiring process, and also potentially help identify latent effects in this process as well.

Overall, a broadened analysis of this phenomenon across varying institutional types, diverse STEM unit types, and from a longitudinal perspective would provide a richer, more generalizable set of approaches regarding faculty recruitment and hiring in STEM for equity.

A *Personal* Look at STEM Approaches to Faculty Diversification

As noted in the "Food for Thought" section of Chapter X, the qualitative data point to the importance of social identities of the unit leaders as a potential indicator in attracting a more compositionally diverse faculty. This was primarily noted in chemistry with Diana, ILS with Richard, and ES with Esther. While several of the faculty and chairs/deans pointed to the importance of their gender and/or race/ethnicity as important to the recruitment process, there was not much depth to the insights. While representational diversity can be important, we also know that social identities and personal life experiences impact a chair's/dean's positionality (Kezar, 2012). Therefore, diving deeper into understanding the social identity of the unit leader

is an important indicator in attracted more underrepresented faculty, or if there are other factors at play. Also disaggregating (if an impact is found to be present) to understand if the influence is based on representational identity, positionality, or other factors. This study could be considered from a mixed methods design as well, if these data were collected for all unit leaders during the time of recruitment and hiring.

Conclusion

In conclusion, based on the findings and analyses conducted in this mixed methods study, effective recruitment and hiring of women faculty and/or faculty of color in STEM is facilitated through approaches in all four quadrants represented in the Competing Values Framework. As discussed throughout this study, through diversified approaches leaders can begin to "untie *their* hands" while working toward equity in the STEM professoriate. These varying approaches were identified in response to this overarching research question: *What approaches do STEM departments take that are working to attract more women faculty and/or faculty of color than their disciplinary counterparts?* The research design was determined by the two sub-questions that guided this broader inquiry: 1) *Does the wording of job postings affect the composition of the applicant pool, and hiring, in STEM departments;* and 2) *What have STEM deans and/or department chairs done to motivate change in recruitment and hiring practices?*

In arriving to this overarching conclusion, the combined (quantitative and qualitative) results pointed to three main thematic approaches. The first thematic approach identified highlighted the "necessary leadership [required] to motivate change." As discussed in Chapter XII, in order to successfully motivate units to change, a unit leader should embody 5 behaviors and characteristics: an unapologetic stance on diversity, implement a framing for change at the

intersection of academic discipline and diversity, be resourceful in garnering and leveraging support, embody a shared leadership style, and leverage their positionality as a tool for motivating change. The second thematic approach pointed to perspectives within "The search process: A spotlight on recruitment and hiring." This approach emphasizes 3 major aspects that influence a successful recruitment and hiring process for STEM units working to attract more compositionally diverse faculty: routinizing the search process, finding open windows of opportunity in the search process, and integrating *both* traditional hiring *and* non-traditional opportunities. The third thematic approach underscored the value of "Daily recruitment: Focusing on organizational climate." This approach points to 2 central indicators of a positive organizational climate: signals of an inclusive climate and signals of support structures in place.

Therefore, while some STEM departments/schools may feel as thought "their hands are tied" by legal restrictions and campus policies, the approaches identified in this help to provide insights in to mechanisms for "untying our hands." The intention of this study was to provide strengths-based approaches for the recruitment and hiring of women faculty and/or faculty of color into STEM, in an effort to provide faculty and administrators with strategies of hope. The cases highlighted in this study point to units that are successfully working within the constraints of the law and campus-based policy parameters for hiring as well, and are finding opportunities and approaches to attracting more underrepresented faculty into their units. The windows of opportunity are present, but they have to be opened with vigor that is deep-seated in the value of diversity broadly.

Appendices

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Appendix A: Examples of Broad and Narrow Job Posting Language

Examples of *Broad* Job Postings

- "Patient care, supervision and teaching of medical students and residents, clinical and/or laboratory research, and administrative duties. This position is posted as Clinical Instructor/Asst Prof/Assoc Prof/Clinical Professor. Rank of selected candidate is dependent upon qualifications.

  M.D., Board certified or residency trained in Emergency Medicine or Pediatric Emergency Medicine. Hold or have the ability to obtain the appropriate medical licenses in the State of [XX]. Experience in Emergency Medicine. Evidence of competence in clinical and didactic teaching is expected."

- "The Law School is seeking outstanding candidates for faculty appointments as either Assistant Professors or Professors of Law. Applicants should have a record of distinguished academic achievement. A demonstrated potential for sophisticated scholarly production is crucial; evidence of such scholarship in hand is strongly preferred.

  Extent of ability to produce original legal scholarship of outstanding quality. Extent of evident ability to teach well in large and small groups. Extent of ability to stimulate and critique research of colleagues. Extent of legal experience and pertinence of fields of interest. Must have a J.D. Degree or equivalent, superlative performance in law school and any subsequent endeavor, and the promise of outstanding performance as teacher and scholar."

- "The Midwestern University, School of Nursing is seeking outstanding faculty members who are actively investigating current and emerging areas of nursing science. We are soliciting applications from established or beginning scholars who are conducting applied or basic research relevant to nursing science. Applications from individuals who are seeking positions on the tenure and clinical tracks will be considered. Applicants will be considered for any rank, depending on experience and research productivity. Applicants must have demonstrated research productivity or potential for same. Diversity is highly valued and applications from members of groups underrepresented in nursing are encouraged."

- "The Department of Economics solicits applications in any field. The Department expects to have multiple positions at all ranks subject to budgetary approval and all positions will

begin September 1, 2008. Research capacity and teaching ability serve as the primary criteria for selection. Ph.D. and strong research orientation are required, with Ph.D. expected by August 2008 for junior applicants. Junior applicants should submit curriculum vitae, three reference letters, research statements, completed research papers and, if available, evidence of teaching quality"

- "The School of Arts and Science at Midwestern University is seeking to recruit one or more quantitative methodologists in the social sciences. This is part of a college-wide initiative to extend long-standing strengths in the quantitative social sciences. Participating departments include Communication Studies, Economics, Political Science, Psychology, Sociology, and Statistics. Faculty at all levels will be considered. Senior, tenured faculty will typically have a joint appointment in two departments and must be top scholars whose expertise strikes a balance between disciplinary specialization and general methodological development. Junior candidates should also have disciplinary and strong methodology interests."

Examples of *Narrow* Job Postings

- "The Department of Internal Medicine, Division of Pulmonary Medicine is seeking candidates with a Ph.D degree in life sciences and productive post-doctoral training to conduct research in lung cancer with emphasis in characterizing and targeting molecular and cellular interactions in tumor microenvironment, and to publish and present results. Duties also include teaching of residents, fellows and lab personnel in a laboratory environment.

  Ph.D degree in life sciences. Experience in animal models, cell biology, genomic, proteomic and systems biology approaches is desirable. Preference will be given to candidates with established extramurally funded research program. Candidate should possess the critical elements of teaching (knowledge of subject matter, skill in presentation, enthusiastic approach, etc.)"

- "The Midwestern University department of Internal Medicine is seeking candidates for a faculty position in the Division of Endocrinology, Metabolism & Diabetes to conduct research on beta cell biology and dysfunction in healthy and diabetic transgenic mouse models. The successful candidate will also be expected to participate in patient care and teaching in inpatient and outpatient settings.

  The ideal candidate should have an M.D. degree and a Ph.D. degree in an appropriate field, postgraduate clinical and research training, and experience in the investigation of beta cell biology and the use of transgenic mouse model systems. Hold or have the ability to obtain the appropriate medical licenses in the State of Michigan. Candidates should demonstrate evidence of independence in the research setting and also be able to

collaborate effectively with other researchers. Good oral and written communication skills are essential."

- "The College of Engineering, Midwestern University, is seeking candidates for tenure-track faculty positions in autonomous vehicles/robots, an important growth area of the College. The appointments will be in one or more appropriate departments in the College, based upon the background of the successful applicants. The College of Engineering is especially interested in candidates who can contribute, through their research, teaching and/or service, to the diversity and excellence of the academic community. Appointments at all levels will be considered; including the tenured Associate Professor and Full Professor levels."

- "The Department of Health Behavior and Health Education at Midwestern University, School of Public Health seeks candidates for the position of Assistant Professor. The start date for this tenure-track position is September 1, 2009.

  We seek candidates with expertise in mass media and public health education who have strong methodological skills in experimental design and intervention research. Candidates who focus on communicating health messages through traditional media channels (e.g., television, radio, print) as well as more cutting edge E-technologies (e.g., web 2.0, cell phones, PDA, etc.) are especially encouraged to apply. The Department has several senior faculty members with an interest in health communications research that spans a wide range of health content areas. The successful candidate will have extensive opportunities to collaborate with these faculty members as well as other faculty across the university.

  Faculty responsibilities will include developing and maintaining an externally funded program of research, graduate teaching and advising, and contributing to the academic mission of the department."

Appendix B: Examples of Diversity Statements in Job Postings[28]

- A: "The college is especially interested in qualified candidates who can contribute, through their research, teaching, and/or service, to the diversity and excellence of the academic community."

- B: "The University is responsive to the needs of dual career couples."

- C: "Women, minorities, individuals with disabilities, and veterans are encouraged to apply."

- D: "The University of XXX [or school/college/department] seeks to recruit and retain a diverse workforce as a reflection of our commitment to serve the diverse people of XXX, to maintain the excellence of the University, and to offer our students richly varied disciplines, perspectives, and ways of knowing and learning."

- E: The school/department is interested in candidates who have demonstrated commitment to excellence by providing leadership in teaching, research, or service toward building an equitable and diverse scholarly environment."

- F: "We will consider applicants knowledgeable in general areas of XXX. There are several broad areas of interest, including [several named]. In general we give highest priority to the overall originality and promise of the candidate's work rather than to the sub-area of specialization. XXX University is an equal opportunity/affirmative action employer and is committed to increasing the diversity of its faculty. *We welcome nominations of and applications from anyone who would bring additional dimensions to the university's research, teaching, and clinical mission, including women, members of minority groups, protected veterans and individuals with disabilities."*

[28] Source: [Midwestern University] Office of the Provost in Conjunction with the [Diversity Transformational Grants] Program. (August 2014). Handbook for Faculty Searches and Hiring.

Appendix C: National Center for Education Statistics List of STEM Fields and Associated 2000 CIP Codes

Table A-1. List of STEM fields and associated 2000 CIP codes

STEM field CIP code CIP title

11.0101 Computer and Information Sciences, General.

11.0102 Artificial Intelligence and Robotics.

11.0103 Information Technology.

11.0201 Computer Programming/Programmer, General.

11.0202 Computer Programming, Specific Applications.

11.0203 Computer Programming, Vendor/Product Certification.

11.0301 Data Processing and Data Processing Technology/Technician.

11.0401 Information Science/Studies.

11.0501 Computer Systems Analysis/Analyst.

11.0701 Computer Science.

11.0801 Web Page, Digital/Multimedia and Information Resources Design.

11.0802 Data Modeling/Warehousing and Database Administration.

11.0803 Computer Graphics.

11.0901 Computer Systems Networking and Telecommunications.

11.1001 System Administration/Administrator.

11.1002 System, Networking, and LAN/WAN Management/Manager.

11.1003 Computer and Information Systems Security.

11.1004 Web/Multimedia Management and Webmaster.

14.0101 Engineering, General.

14.0201 Aerospace, Aeronautical and Astronautical Engineering.

14.0301 Agricultural/Biological Engineering and Bioengineering.

14.0401 Architectural Engineering.

14.0501 Biomedical/Medical Engineering.

14.0601 Ceramic Sciences and Engineering.

14.0701 Chemical Engineering

14.0801 Civil Engineering, General.

14.0802 Geotechnical Engineering.

14.0803 Structural Engineering.

14.0804 Transportation and Highway Engineering.

14.0805 Water Resources Engineering.

14.0901 Computer Engineering, General.

14.0902 Computer Hardware Engineering.

14.0903 Computer Software Engineering.

14.1001 Electrical, Electronics and Communications Engineering.

14.1101 Engineering Mechanics.

14.1201 Engineering Physics.

14.1301 Engineering Science.

14.1401 Environmental/Environmental Health Engineering.

14.1801 Materials Engineering.

14.1901 Mechanical Engineering.

14.2001 Metallurgical Engineering.

14.2101 Mining and Mineral Engineering.

See notes at end of table.

Computer and information

sciences

Engineering and

engineering technologies

14.2201 Naval Architecture and Marine Engineering.

14.2301 Nuclear Engineering.

14.2401 Ocean Engineering.

14.2501 Petroleum Engineering.

14.2701 Systems Engineering.

14.2801 Textile Sciences and Engineering.

14.3101 Materials Science.

14.3201 Polymer/Plastics Engineering.

14.3301 Construction Engineering.

14.3401 Forest Engineering.

14.3501 Industrial Engineering.

14.3601 Manufacturing Engineering.

14.3701 Operations Research.

14.3801 Surveying Engineering.

14.3901 Geological/Geophysical Engineering.

15.0000 Engineering Technology, General.

15.0101 Architectural Engineering Technology/Technician.

15.0201 Civil Engineering Technology/Technician.

15.0303 Electrical, Electronic and Communications Engineering Technology/Technician.

15.0304 Laser and Optical Technology/Technician.

15.0305 Telecommunications Technology/Technician.

15.0401 Biomedical Technology/Technician.

15.0403 Electromechanical Technology/Electromechanical Engineering Technology.

15.0404 Instrumentation Technology/Technician.

15.0405 Robotics Technology/Technician.

15.0501

Heating, Air Conditioning and Refrigeration Technology/Technician

(ACH/ACR/ACHR/HRAC/HVAC/AC Technology).

15.0503 Energy Management and Systems Technology/Technician.

15.0505 Solar Energy Technology/Technician.

15.0506

Water Quality and Wastewater Treatment Management and Recycling

Technology/Technician.

15.0507 Environmental Engineering Technology/Environmental Technology.

15.0508 Hazardous Materials Management and Waste Technology/Technician.

15.0607 Plastics Engineering Technology/Technician.

15.0611 Metallurgical Technology/Technician.

15.0612 Industrial Technology/Technician.

15.0613 Manufacturing Technology/Technician.

15.0701 Occupational Safety and Health Technology/Technician.

15.0702 Quality Control Technology/Technician.

15.0703 Industrial Safety Technology/Technician.

15.0704 Hazardous Materials Information Systems Technology/Technician.

15.0801 Aeronautical/Aerospace Engineering Technology/Technician.

15.0803 Automotive Engineering Technology/Technician.

Engineering and

engineering technologies

—Continued

See notes at end of table.

15.0805 Mechanical Engineering/Mechanical Technology/Technician.

15.0901 Mining Technology/Technician.

15.0903 Petroleum Technology/Technician.

15.1001 Construction Engineering Technology/Technician.

15.1102 Surveying Technology/Surveying.

15.1103 Hydraulics and Fluid Power Technology/Technician.

15.1201 Computer Engineering Technology/Technician.

15.1202 Computer Technology/Computer Systems Technology.

15.1203 Computer Hardware Technology/Technician.

15.1204 Computer Software Technology/Technician.

15.1301 Drafting and Design Technology/Technician, General.

15.1302 CAD/CADD Drafting and/or Design Technology/Technician.

15.1303 Architectural Drafting and Architectural CAD/CADD.

15.1304 Civil Drafting and Civil Engineering CAD/CADD.

15.1305 Electrical/Electronics Drafting and Electrical/Electronics CAD/CADD.

15.1306 Mechanical Drafting and Mechanical Drafting CAD/CADD.

15.1401 Nuclear Engineering Technology/Technician.

15.1501 Engineering/Industrial Management.

26.0101 Biology/Biological Sciences, General.

26.0102 Biomedical Sciences, General.

26.0202 Biochemistry.

26.0203 Biophysics.

26.0204 Molecular Biology.

26.0205 Molecular Biochemistry.

26.0206 Molecular Biophysics.

26.0207 Structural Biology.

26.0208 Photobiology.

26.0209 Radiation Biology/Radiobiology.

26.0210 Biochemistry/Biophysics and Molecular Biology.

26.0301 Botany/Plant Biology.

26.0305 Plant Pathology/Phytopathology.

26.0307 Plant Physiology.

26.0308 Plant Molecular Biology.

26.0401 Cell/Cellular Biology and Histology.

26.0403 Anatomy.

26.0404 Developmental Biology and Embryology.

26.0405 Neuroanatomy.

26.0406 Cell/Cellular and Molecular Biology.

26.0407 Cell Biology and Anatomy.

26.0502 Microbiology, General.

26.0503 Medical Microbiology and Bacteriology.

26.0504 Virology.

Engineering and

engineering technologies

Biological and biomedical

sciences

See notes at end of table.

26.0505 Parasitology.

26.0506 Mycology.

26.0507 Immunology.

26.0701 Zoology/Animal Biology.

26.0702 Entomology.

26.0707 Animal Physiology.

26.0708 Animal Behavior and Ethology.

26.0709 Wildlife Biology.

26.0801 Genetics, General.

26.0802 Molecular Genetics.

26.0803 Microbial and Eukaryotic Genetics.

26.0804 Animal Genetics.

26.0805 Plant Genetics.

26.0806 Human/Medical Genetics.

26.0901 Physiology, General.

26.0902 Molecular Physiology.

26.0903 Cell Physiology.

26.0904 Endocrinology.

26.0905 Reproductive Biology.

26.0906 Neurobiology and Neurophysiology.

26.0907 Cardiovascular Science.

26.0908 Exercise Physiology.

26.0909 Vision Science/Physiological Optics.

26.0910 Pathology/Experimental Pathology.

26.0911 Oncology and Cancer Biology.

26.1001 Pharmacology.

26.1002 Molecular Pharmacology.

26.1003 Neuropharmacology.

26.1004 Toxicology.

26.1005 Molecular Toxicology.

26.1006 Environmental Toxicology.

26.1007 Pharmacology and Toxicology.

26.1101 Biometry/Biometrics.

26.1102 Biostatistics.

26.1103 Bioinformatics.

26.1201 Biotechnology.

26.1301 Ecology.

26.1302 Marine Biology and Biological Oceanography.

26.1303 Evolutionary Biology.

26.1304 Aquatic Biology/Limnology.

26.1305 Environmental Biology.

26.1306 Population Biology.

See notes at end of table.

Biological and biomedical

sciences—Continued

26.1307 Conservation Biology.

26.1308 Systematic Biology/Biological Systematics.

26.1309 Epidemiology.

27.0101 Mathematics, General.

27.0102 Algebra and Number Theory.

27.0103 Analysis and Functional Analysis.

27.0104 Geometry/Geometric Analysis.

27.0105 Topology and Foundations.

27.0301 Applied Mathematics.

27.0303 Computational Mathematics.

27.0501 Statistics, General.

27.0502 Mathematical Statistics and Probability.

52.1304 Actuarial Science.

Physical sciences 40.0101 Physical Sciences.

40.0201 Astronomy.

40.0202 Astrophysics.

40.0203 Planetary Astronomy and Science.

40.0401 Atmospheric Sciences and Meteorology, General.

40.0402 Atmospheric Chemistry and Climatology.

40.0403 Atmospheric Physics and Dynamics.

40.0404 Meteorology.

40.0501 Chemistry, General.

40.0502 Analytical Chemistry.

40.0503 Inorganic Chemistry.

40.0504 Organic Chemistry.

40.0506 Physical and Theoretical Chemistry.

40.0507 Polymer Chemistry.

40.0508 Chemical Physics.

40.0601 Geology/Earth Science, General.

40.0602 Geochemistry.

40.0603 Geophysics and Seismology.

40.0604 Paleontology.

40.0605 Hydrology and Water Resources Science.

40.0606 Geochemistry and Petrology.

40.0607 Oceanography, Chemical and Physical.

40.0801 Physics, General.

40.0802 Atomic/Molecular Physics.

40.0804 Elementary Particle Physics.

40.0805 Plasma and High-Temperature Physics.

40.0806 Nuclear Physics.

40.0807 Optics/Optical Sciences.

See notes at end of table.

Biological and biomedical

sciences—Continued

Mathematics and

statistics

40.0808 Solid State and Low-Temperature Physics.

40.0809 Acoustics.

40.0810 Theoretical and Mathematical Physics.

Sciences technologies 29.0101 Military Technologies.

41.0101 Biology Technician/Biotechnology Laboratory Technician.

41.0204 Industrial Radiologic Technology/Technician.

41.0205 Nuclear/Nuclear Power Technology/Technician.

41.0301 Chemical Technology/Technician.

51.1401 Medical Scientist (MS, PhD)

Source: Ginder, S., & Mason, M. (2011). Postsecondary Awards in Science, Technology, Engineering, and Mathematics, by State: 2001 and 2009. Web Tables. NCES 2011-226. National Center for Education Statistics.

NOTE: The Classification of Instructional Programs (CIP) codes corresponding to science, technology, engineering, and mathematics
(STEM) fields were selected based on a U.S. Immigration and Customs Enforcement list of designated STEM degree programs.

Appendix D: Faculty Interview Protocol for *"What have STEM deans and/or department chairs done to motivate change in recruitment and hiring practices?"*

Introduction

- Thank participant for their time and for their willingness to participate.
- My goal is to better understand organizational factors that motivate departments to reconsider their faculty recruitment and hiring practices for diversity. This will be the focus of our interview today.
- Complete and collect IRB document. Provide the participant an extra copy if they would like one. Confirm consent to audio-record the interview. Reiterate the benefits for accuracy in transcription and for my attention during the interview.

Transition

There will be three main topics I would like to discuss: the program's history, your current recruitment and hiring practices, and how you and your colleagues think about diversity. If there are any questions you prefer not to answer, please feel free to pass. Should you need to end the interview early, please be assured that it will not compromise my research effort. Do you have any questions before we get started?

Departmental History

1. I've identified your program as being successful at hiring more *** faculty than your disciplinary partners. Has this always been the case? How have things changed over time?
    a. *Probe:* To what do you attribute the change (i.e. your program's success)?
    b. *Probe:* Have there been any major events or incidences that shaped the program's trajectory?
2. Is there something or someone in particular that motivated the need for change in these practices?
    a. *Probe:* Was there a particular incident or series of incidences that brought attention to the need for change?
    b. *Probe:* Did someone in particular point out the need for a change in the hiring practices for diverse faculty?
3. Was there a specific leader responsible for the change effort? How did they motivate the faculty to buy into the need for change?

    a. *Probe:* Was the leader of this change process a formal leader or more of an informal leader in the department?
    b. *Probe:* Was the leader a person within the department or outside of the department?
4. At times, leaders are able to capitalize or leverage resources, within the department, on campus, or even outside of campus at time, during times of change. Was this leader able to leverage any resources to help initiate and sustain the change process?
    a. *Probe:* Resources here are defined in the broadest sense, including financial, talents, skills, power, prestige, ranking, influence, etc.
5. What's working well here? To what do you attribute your program's success?
    a. *Probe:* How do you think relationships in your department are different than those in programs that struggle to attract women faculty or faculty of color?
6. Can you share a story about one of the challenges that you've encountered along the way?
    a. *Probe:* How did you or the program respond to these challenges?
    b. *Probe:* What were the strategies?
7. Does your department currently have a strategic plan or other formal goals for diversity?
    a. *Probe:* Who sets the goals?
    b. *Probe:* How are they set?

Recruitment & Hiring Practices

1. What facilitates the recruitment of women faculty in ***? Or of faculty of color? What recruitment practices do you use?
2. What turns off women from applying to faculty positions in ***? What turns off people of color from applying to faculty positions in ***? How, if at all, has the program tried to work around these challenges?
3. When faculty positions open, I assume your program must be fortunate to have a large pool of applicants. Do you believe that to be the case? What are you looking for in a faculty candidate?
    a. *Probe:* Do you think your views differ from the general priorities of *** as a field? If so, how?
4. Who decides what criteria to look for in a faculty candidate? How is that priority communicated?
5. How is a search committee composed? Are there certain criteria for servicing on a hiring committee? Has this always been the departmental practice?
6. Is diversity always a priority in the recruitment and hiring process for faculty? If so, how is that priority sustained throughout the process?
    a. *Probe:* Are there certain points in the recruitment and hiring process where the committee reports back to another leader?
    b. *Probe:* Are there specific strategies that hiring committee use to encourage a diverse pool of applicants?
    c. *Probe:* Are there specific practices that take place with ***every*** recruitment and hiring process that are specifically intended to encourage a diverse hire?
    d. *Probe:* Have any of these strategies changed over time?

Diversity Climate

1. How do you define diversity?
    a. *Probe:* How is it defined in your department?
2. How would you describe the climate for diversity in this program?

Conclusion

1. Is there anything else you think would be important for us to think about with your program, either past or present? With achieving diversity in STEM graduate programs generally?

Thank you once again for your time. I encourage you to follow up with me if would like at any point or if you would like to share any additional information that you feel might be helpful for my study.

Appendix E: Interview Codebook

Collaboration [upper left quadrant of the CVF]

The collaboration quadrant is typified by organizational values and leadership decision-making strategies that are marked by a high sense of organizational commitment, strong interpersonal relationships, high regard for leader as a mentor, teamwork as foundational, and organizational stability as the measure of success. Organizations with recruitment and hiring strategies that are primarily imposed through committee-based work and require organizational buy-in prior to making a position/hire offer are typically behaviors identified in this quadrant. Leaders whose decision-making strategies involve human capital development, consensus building, and a strong process that binds the organization together typify collaborative leadership.

Code	Definition	Example	Notes
Collab_Lead	Collaborative leadership is defined by the way in which the leader guides the work, versus imposes a structure. Shared leadership is highly valued, and leadership is distributed amongst committee or departmental members.	1. At the end of a faculty meeting, we all have to agree that this candidate would make a great colleague in our department. 2. Our chair is deeply invested in mentorship throughout our department.	

	Consensus building is integral to this type of leadership style.	3. As faculty member, I feel supported in my work by the chair/dean, and in turn I also mentor and support junior faculty in towards their success.	
Collab_Org	The most important part of the recruitment/hiring process is ensuring a consensus where all members are in agreement (or at least have a sense of their vote/perspective was validated in the process) when deciding on the person to hire. The culture of the unit is focused on the need for agreement as a reflection of collegiality and team. Cultural norms within the unit ensure that decisions prior to making any offer must be	1. Even though we often have a hunch as to what type of scientist we are needing for the department, we have an annual meeting to discuss our needs and identify the direction and type of scholar we would like to seek. 2. Even for post-doc opportunities that are granted by the university/school, we as a department will still vote to bring in this prospective faculty fellow prior to accepting the placement. 2. We connect them with	

	brought before the department for a formal discussion and/or vote. Cultural norms within the unit that support inclusionary practices for all. Colleagues/faculty work collaboratively on committees and throughout other departmental work. The culture is inclusive of difference. Collaborative organizations value human connection, relationships, and unity in any decision-making process.	current faculty that share similar social identities that can help them see themselves as a future faculty member in our department, at the university, and in our city. Making sure that prospective faculty members can see themselves succeeding, as a whole person, here is important to us.	
Collab_Div	The unit as a whole values diversity as essential and foundational to the future of their field, and their individual work. This diversity ethos speaks to a belief that diversity is/should be integrated into all	1. Our field has a social justice history, and therefore understanding the need to diversify our faculty has not been hard to understand. Our chair/dean using this framing to help us see why diversity is	

	areas and decisions within the department.	important to us as scholars. 2. Our field touches all aspects of life, whether people see it or not, and in order for us to have relevant research and teach to the future, we have to ensure that we have diverse perspectives present. Our chair/dean helps us understand that diverse perspectives are necessary for our work to be relevant.	

Competition [lower right quadrant of the CVF]

The competition quadrant is fundamentally identified by an organizational culture and leadership style that is motivated by prestige and rankings in remaining ahead of disciplinary counterparts. The decisions associated with this quadrant are highly outcome driven, and place an intense level of pressure successful performance. This type of organization and leader measure success by the outcome achieved (i.e., meeting or outpacing their intended goal, outperforming their competitors), rather than the process taken to achieve the outcome. They view most processes, and diversity, as transactional and only valuable in helping them achieve prestige and their desired outcome. Diversity is viewed as an opportunity to *check the box* – either meet

compliance or outperform others – not necessarily as valued as integral to their work. Comparison and comparative activities are frequently engaged.			
Code	**Definition**	**Example**	**Notes**
Compete_Lead	Leadership decisions are made to garner personal success or to ensure that their unit remains competitive. Lead tends to make decisions based on traditional disciplinary values (i.e., rankings, publications, educational training of the applicant). Leadership style is more forceful than guiding. Leaders impose rules or guidelines without consultation. Leadership style can be viewed as more traditional/hierarchical versus collaborative or inviting. Decisions made by leaders are always focused on prestige (i.e., rankings) and strategy to ensure that they remain the most	1. I have heard this person's name at our annual conference several times referred to as the next star in our field. We should "go after them" because it'll be a feather in our cap. 2. We have to hire him. He clearly has so much leadership potential. 3. We aren't ashamed to "troll the waters" for rising stars or a great senior hire. 4. We have to fight for every open line that we get from the dean's office.	

	competitive in the field, school, university, etc.		
Compete_Org	The most important part of the recruitment/hiring process is ensuring the "best" hire is identified in the process. The culture of the unit is focused on achieving their outcomes over anything else. Cultural norms within the unit traditionally reinforce hierarchies and value seniority. Organizational climate is more individualistic versus collectivist. Competitive organizations value productivity and effectiveness in achieving their goals.	1. It is important to get in alignment with the dean because they have a lot of power over who gets positions. They hold the funding, so getting in alignment with their perspectives will help me attain more faculty lines. 2. We invited this graduating student of color to come give a talk in our department on her research. She was absolutely fantastic. Without even consulting anyone, the chair offered her a tenure track position, as he sensed that we would never have an opportunity to recruit another	

		fantastic woman of color to our department otherwise. 3. She was by far the best candidate on the market for her year. She is a rock star, and we were able to bring her here to Midwestern. That was huge for us, in helping turn around our reputation and rankings.	
Compete_Div	Diversity is viewed as a tool and competitive edge within the field. The department/unit is most concerned with how this hire will look to their competitors in the field. The value of diversity is in how it is perceived to their external competitors.	1. We will eventually die out if we don't keep up with diversity. 2. It doesn't look good when we haven't made any diversity hires recently, so we should focus on that. 3. Prospective faculty won't come if they don't see faculty that look like them, so we have to figure out how to hire more women and/or faculty of	

		color so we can recruit more underrepresented faculty and students.	

Routines [lower left quadrant of the CVF]

The routines quadrant is characterized by control and process. Routine organizations value stability, formal structure, little variability, consistency, predictability, and regularity. Leaders functioning in this decision-making style account for success through measures of predictability and lack of failure in the process (i.e., did the routine they imposed create the result they were aiming for). Thus, strong attributes in this quadrant lean toward rules, consistency and uniformity in the process, and accountability to the process. Repetition and reproducibility of processes are critical for success. Firm parameters of processes are highly valued. Success is measured by the process, not as much by the outcome.

Code	**Definition**	**Examples**	**Notes**
Rout_Lead	Routine leadership is defined by the way in which the leader provides a process/guidelines, guides the process, and supervises the process (i.e., recruitment and hiring process). Coordination of processes is	1. The Associate Dean oversees the search committees, and meets regularly with the search committee chair to ensure that the search guidelines are met. The guidelines are outlined in	

	highly valued, and routines are identified by their replicability. Intentionality is integral to this type of leadership style. Decisions trickle down, not flow up. Routine leadership also takes place at the program level (when faculty leads design, implement and lead outreach programs).	detailed in the document that the Associate Dean has developed distinctly for faculty hiring. 2. The chair of the committee leads selected committee, and ensures that the process is followed and reported accordingly to the Associate Dean. 3. We have an annual symposium that I've been leading for years where we bring rising stars in our field, to present and share their research. This is an opportunity to showcase great upcoming work in the field, but also to expose them to the great things happening at Midwestern.	
Rout_Org	The cultural norms in routine	1. After we changed to having	

	organizations value structure and efficiency. Group decisions are guided by a process, or to develop a process that is needed to create efficiency and effectiveness in a given process (i.e., recruitment and hiring). These organizations have a clear reporting structure and formalized positions in place to help guide processes that impact their priorities. Deliberate and prescript actions are required. Group work (i.e., committee-based) tends to have a clearly identified chair/leaders that guides the process and ensures the implementation of given routines. Success is measured by the department/unit's ability to be able to repeat the same process	a strict protocol for our recruitment and hiring process, we have continued to have success in hiring more women faculty and faculty of color. 2. Our strategy for recruiting and hiring more women and faculty of color is defined in our DEI plan.	

	and continue to reap success. Consistency and uniformity of process are highly valued.		
Rout_Div	The perspective on diversity is that diversity of the faculty can only be achieved through prescript and intentional efforts. There is a high value on diversity; however, they do not leave achieving diversity to chance. It must be intentionally integrated into all stages of the hiring process.	1. We can't leave diversity faculty hiring to chance. We have to be very thoughtful and intentional about our strategies for how we recruit and hire women and faculty of color, if we plan to be successful. 2. Throughout our faculty search process, we ensure that the search chair meets with the deans at specific stages to ensure they are following the protocol. We know the protocol will work in hiring more women and faculty of color, but we need to make sure that the committees are following the guidelines.	

Non-Routines [upper right quadrant of the CVF]

The non-routines quadrant is characterized by organizational flexibility, creativity, and innovation. Leadership values risk-taking, unique opportunities, and futuristic vision. This leadership style is most effective in organizations that are continuously experiencing change or in an environment where resources are unstable. Organizations and leaders that succeed in this quadrant are adaptable, flexible, innovative, and function well with ambiguity. Therefore, processes in this quadrant are sporadic, not repeatable, unique, and lead to unplanned outcomes (both positive and negative). Outcomes are unpredictable, serendipitous, and idiosyncratic. Change in this quadrant is episodic versus continuous in nature.

Code	**Definition**	**Examples**	**Notes**
Nonrout_Lead	Non-Routine leadership is defined by the lack of intentionality in processes (i.e., recruitment and hiring process). These leaders tend to rely on organic developments, and the leaders style of guiding is more reactionary and haphazard toward achieving their goals (i.e., faculty diversification). These leaders value	1. We haven't been able to acquire a faculty line in almost 10 years, so we are very grateful for the *random* post-doctoral opportunities that the division and Provost make available to us. It's help us diversity and grow our faculty. 2. We have to wait for the unexpected opportunities or programs that the university	

	entrepreneurial ideas, are open to creative solutions to problems, and tend to be visionary leaders. There is a lack of flow in decision-making. Leadership decision-making is unpredictable. Creativity, innovation, and adaptability are highly valued. Success is measured by the innovation of the outcome. Leaders tend to be risk-takers, as high risk-high reward opportunities are valued.	offers for us to capitalize on to hire diverse faculty. We don't see any other options. 3. We are experimentalists by nature. So we approached change in our recruitment and hiring practices as an experiment. 4. We were at an informal dinner with all scientists of color at a conference, just hanging out. I took the opportunity to share that we might be hiring soon and encouraged people to apply. This was outside of the regular search process, but that's how we were able to get [my now colleague] to apply.	
Nonrout_Org	The most important part of the	1. We feel fortunate to have	

	recruitment/hiring process is ensuring the flexibility and adaptability is built into the process. The culture of the department/school is focused on being accessible and receptive to new opportunities whenever they come. The environment in a non-routine organization feels chaotic and unstable. Organic decision-making processes are valued. Structure can be loose, but open to innovation.	the MTFP post-doctoral fellowship available to us, but we also know that this is a temporary solution and it's very hard because we don't have a process for bringing these people onto the faculty. 2. We didn't know that ILFP post-doctoral fellowship would be available to us that year, however it also provided an opportunity for us to hire a faculty member of color. But the process felt very ambiguous, and we just tried to go with it.	
Nonrout_Div	Diversity is viewed as important, but is not intentionally integrated into their foundation work or perceptions of how to attract more women and/or people of	1. Sure, most of the faculty members weren't forwardly resistant to the process but they also weren't invested in needing to hire a person of color.	

	color. The diversity ethos in this quadrant is described as: diversity is an added bonus when if we can achieve it.	2. We needed to change our processes so I leaned into the mission of our school and discipline, which focuses on social justice. This helped the resisters just come along, until they saw that the new process was successful.	

Appendix F: Competing Values Framework for Faculty Recruitment & Hiring in STEM Reflecting Organizational and Diversity Ethos Decision-Making Approaches

Figure 14. Overlapping Comparison of the Competing Values Framework for the Faculty Recruitment and Hiring Process Reflecting Organizational Decision-Making for All Units

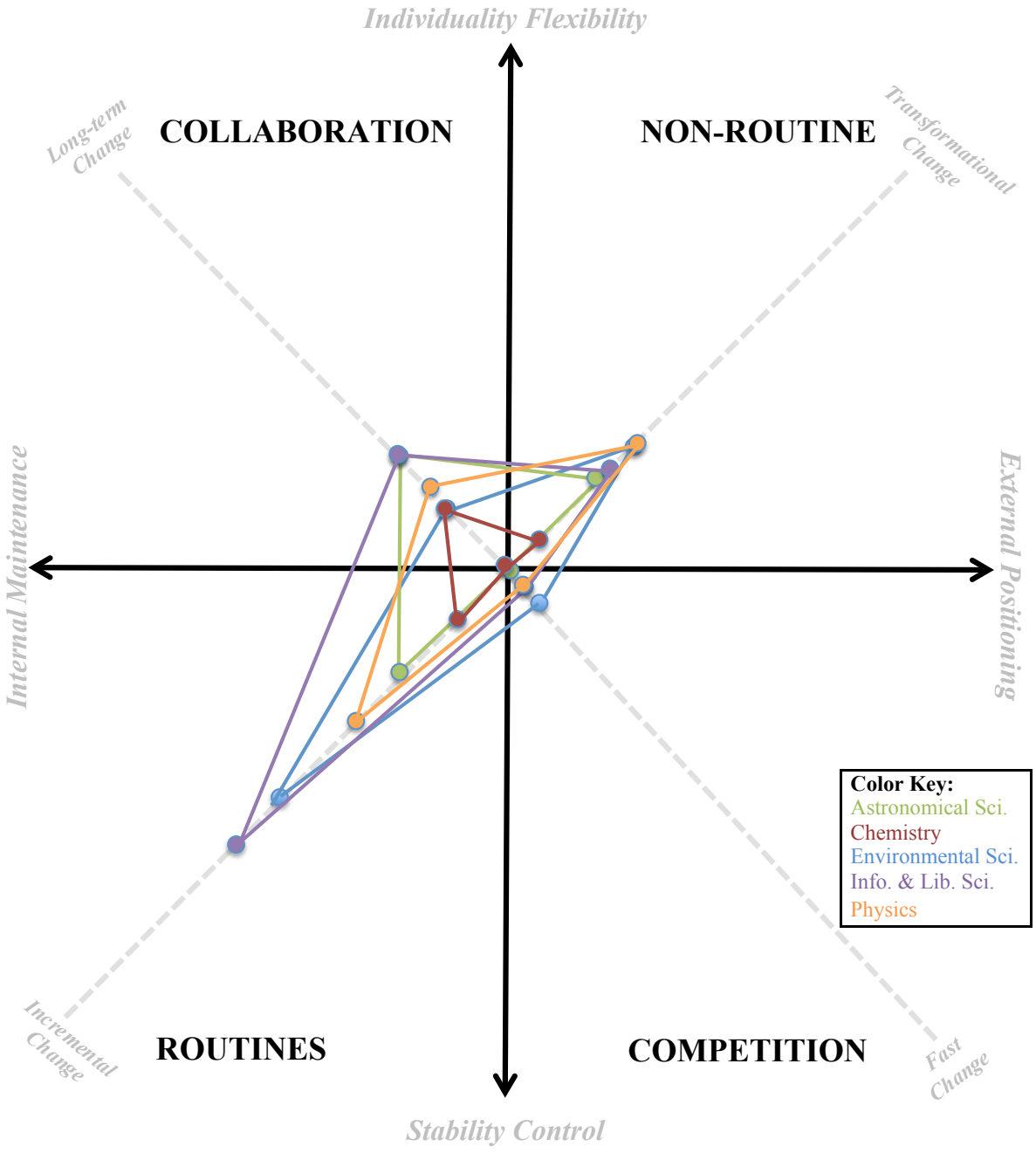


Figure 15. Competing Values Framework for the Faculty Recruitment and Hiring Process Reflecting Organizational Decision-Making in Astronomical Sciences

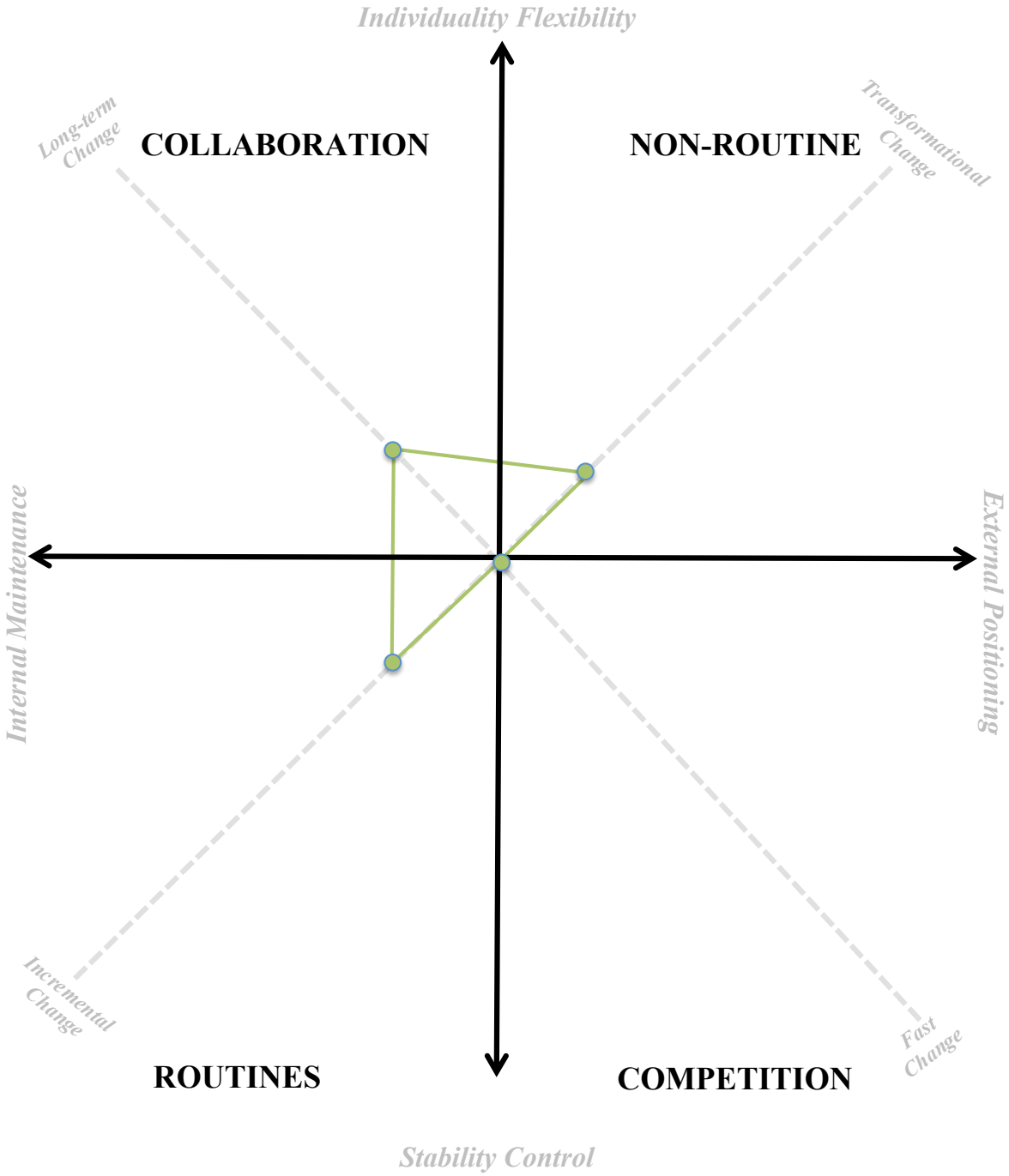


Figure 16. Competing Values Framework for the Faculty Recruitment and Hiring Process Reflecting Organizational Decision-Making in Chemistry

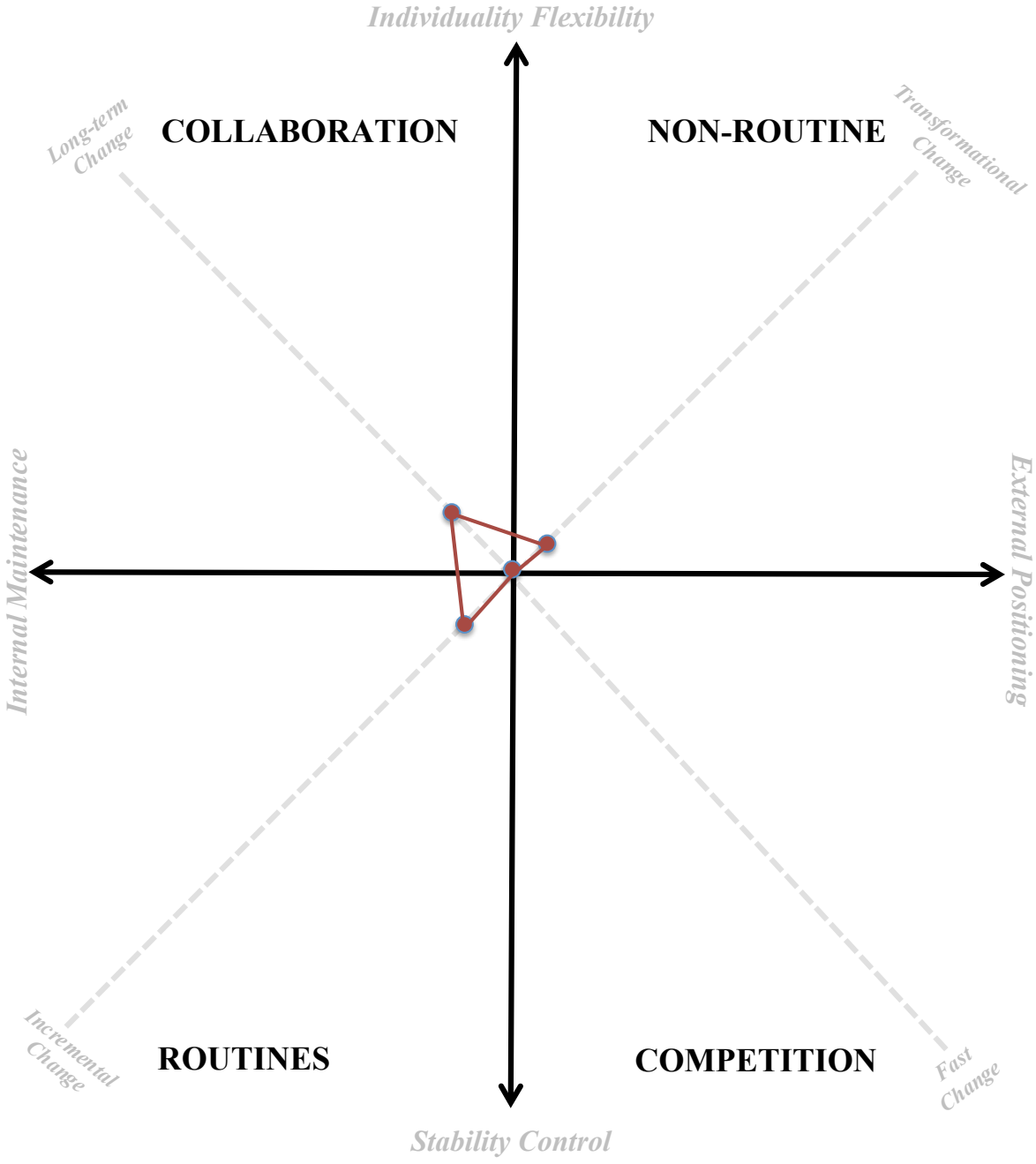


Figure 17. Competing Values Framework for the Faculty Recruitment and Hiring Process Reflecting Organizational Decision-Making in Environmental Sciences

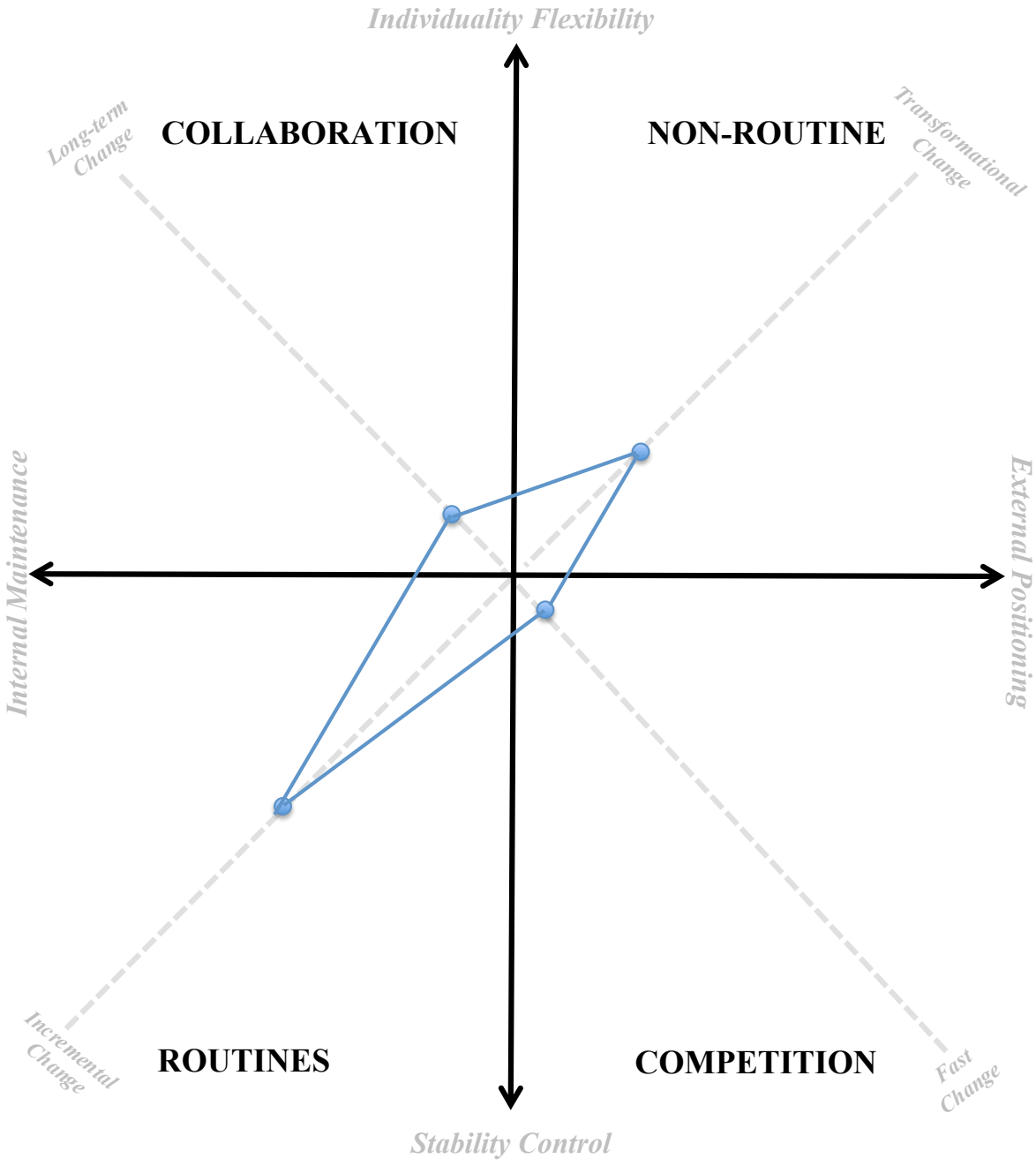


Figure 18. Competing Values Framework for the Faculty Recruitment and Hiring Process Reflecting Organizational Decision-Making in Information & Library Sciences

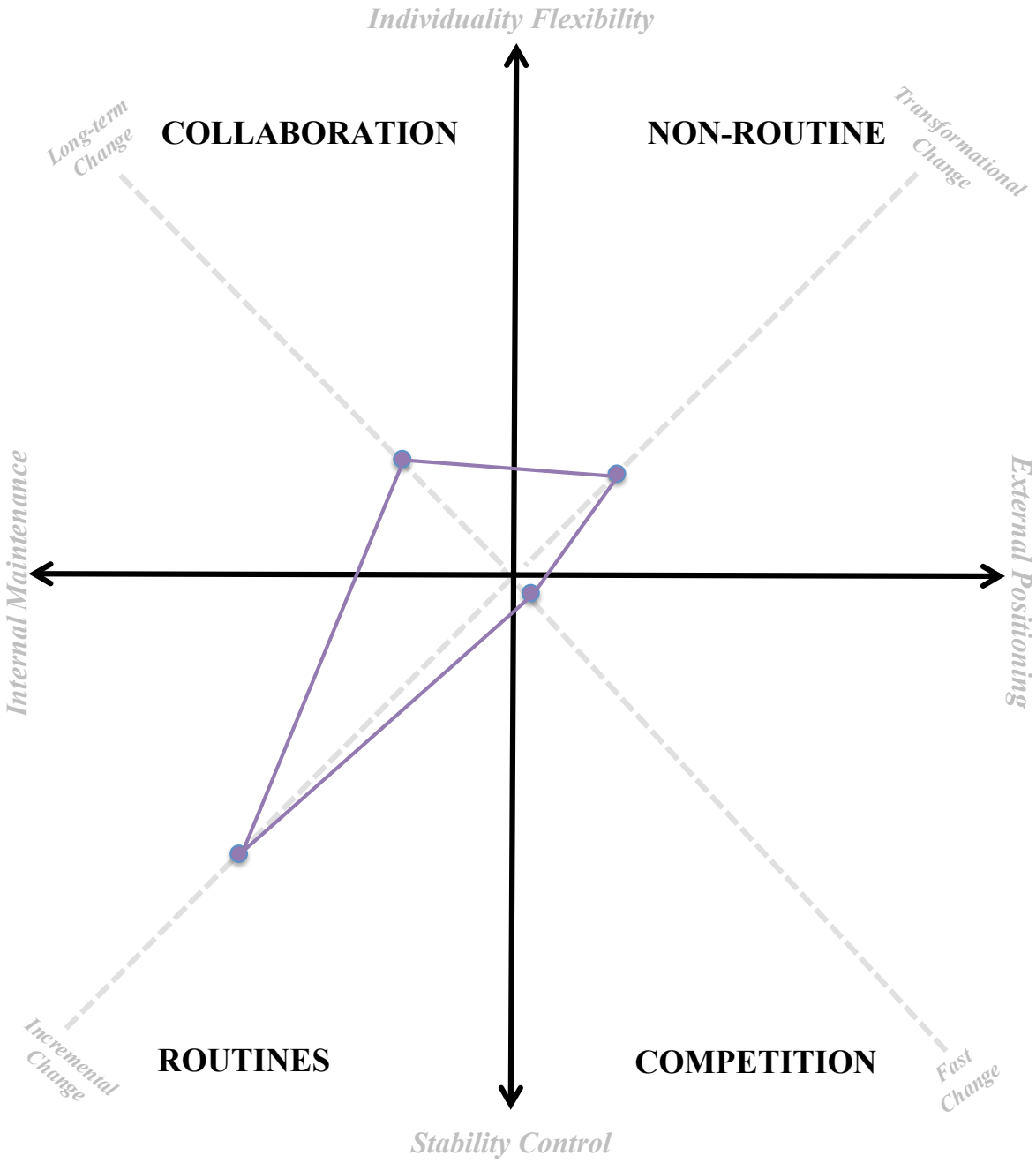


Figure 19. Competing Values Framework for the Faculty Recruitment and Hiring Process Reflecting Organizational Decision-Making in Physics

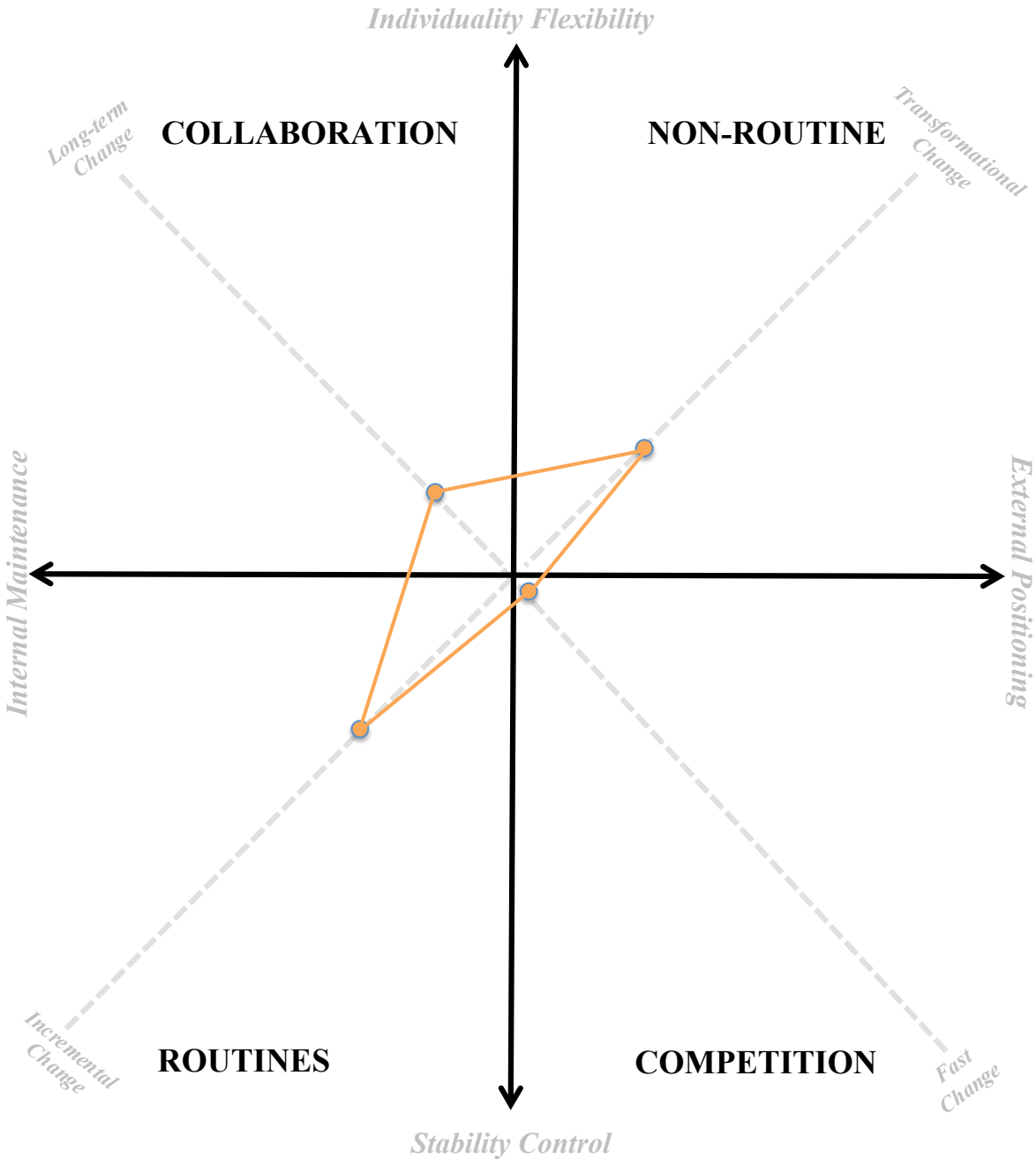


Figure 20. Overlapping Comparison of the Competing Values Framework for the Faculty Recruitment and Hiring Process Reflecting the Diversity Ethos of All Units Via Decision-Making Processes

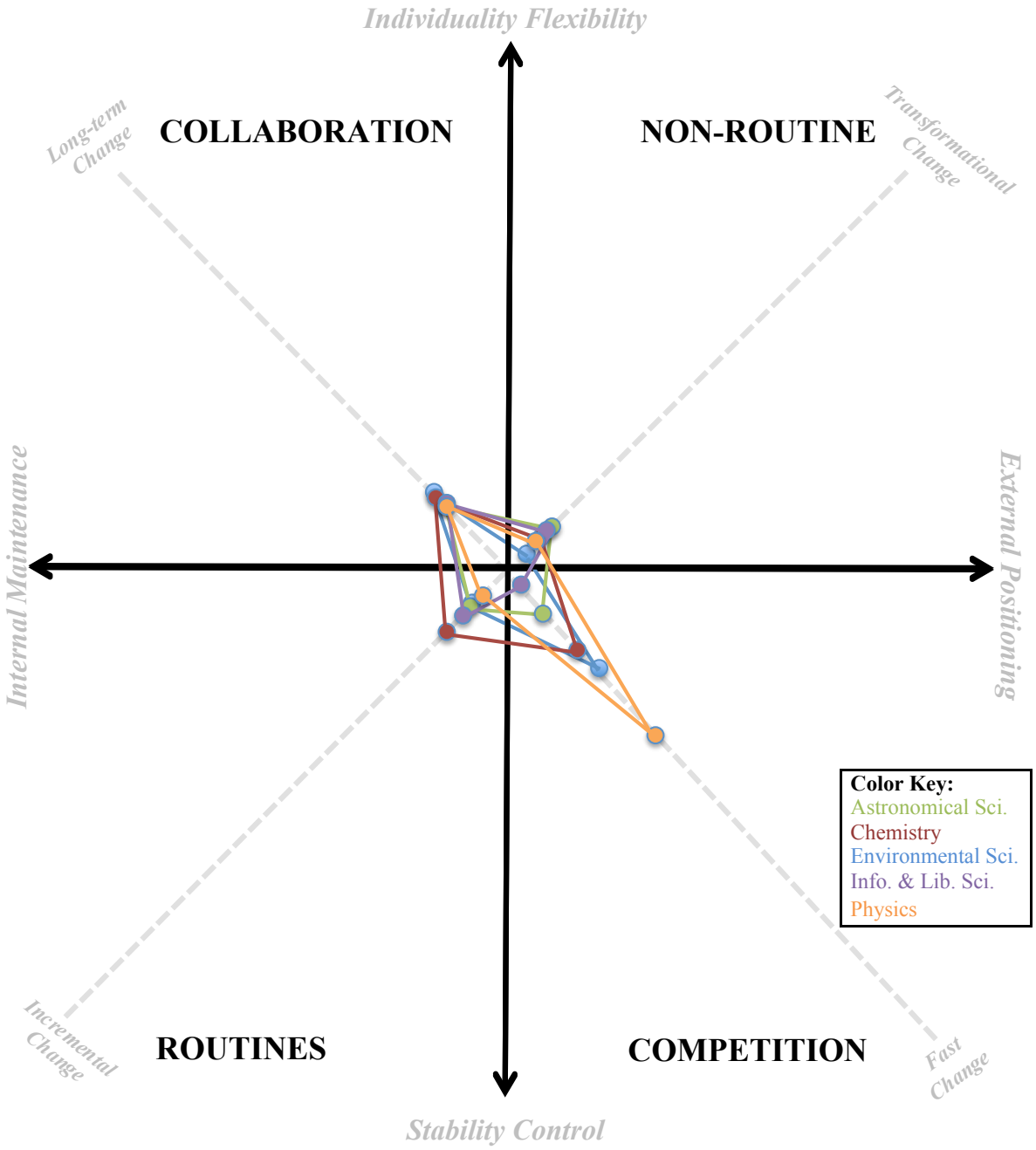


Figure 21. Competing Values Framework for the Faculty Recruitment and Hiring Process Reflecting the Diversity Ethos of Astronomical Sciences Via Decision-Making Processes

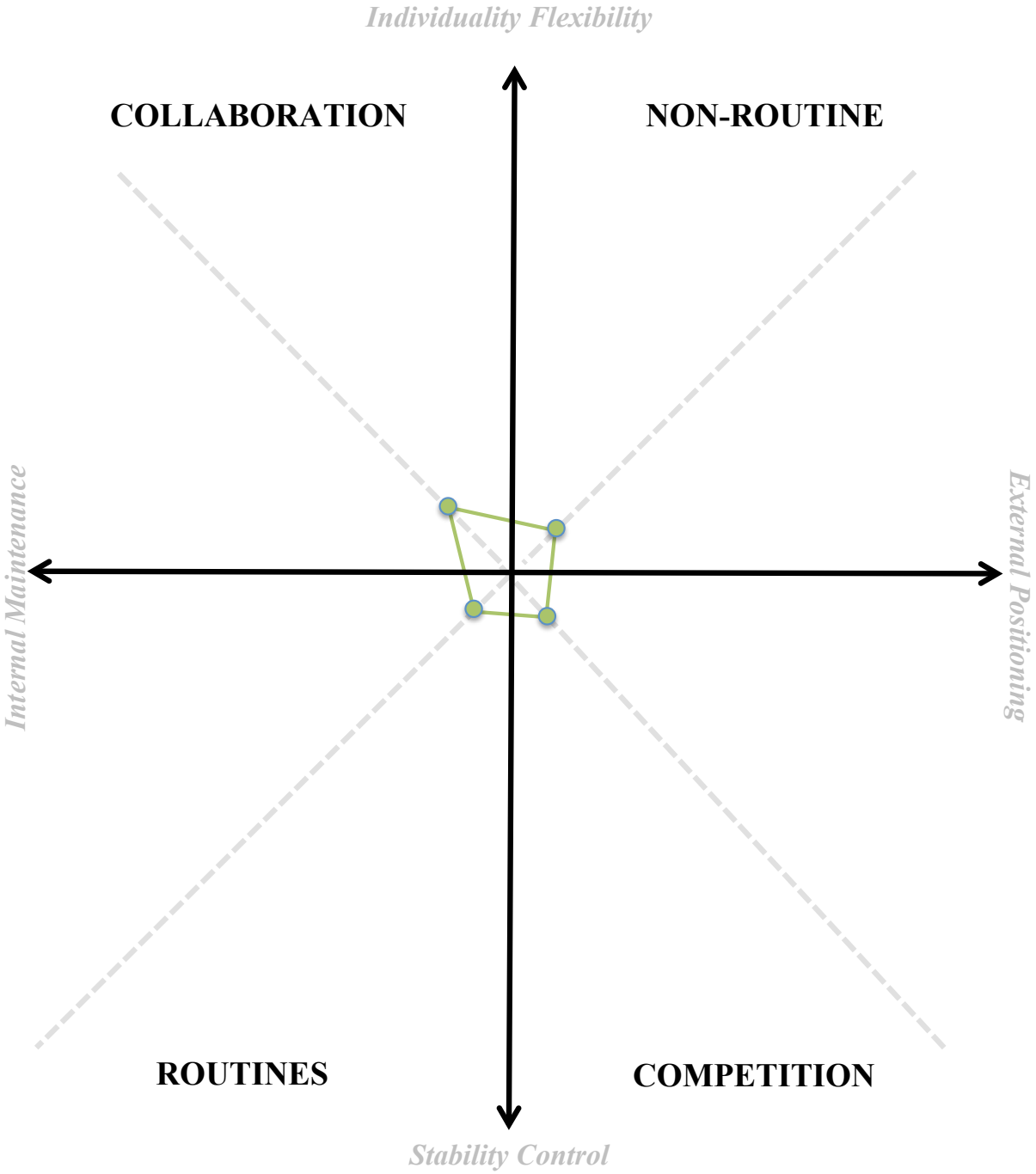


Figure 22. Competing Values Framework for the Faculty Recruitment and Hiring Process Reflecting the Diversity Ethos of Chemistry Via Decision-Making Processes

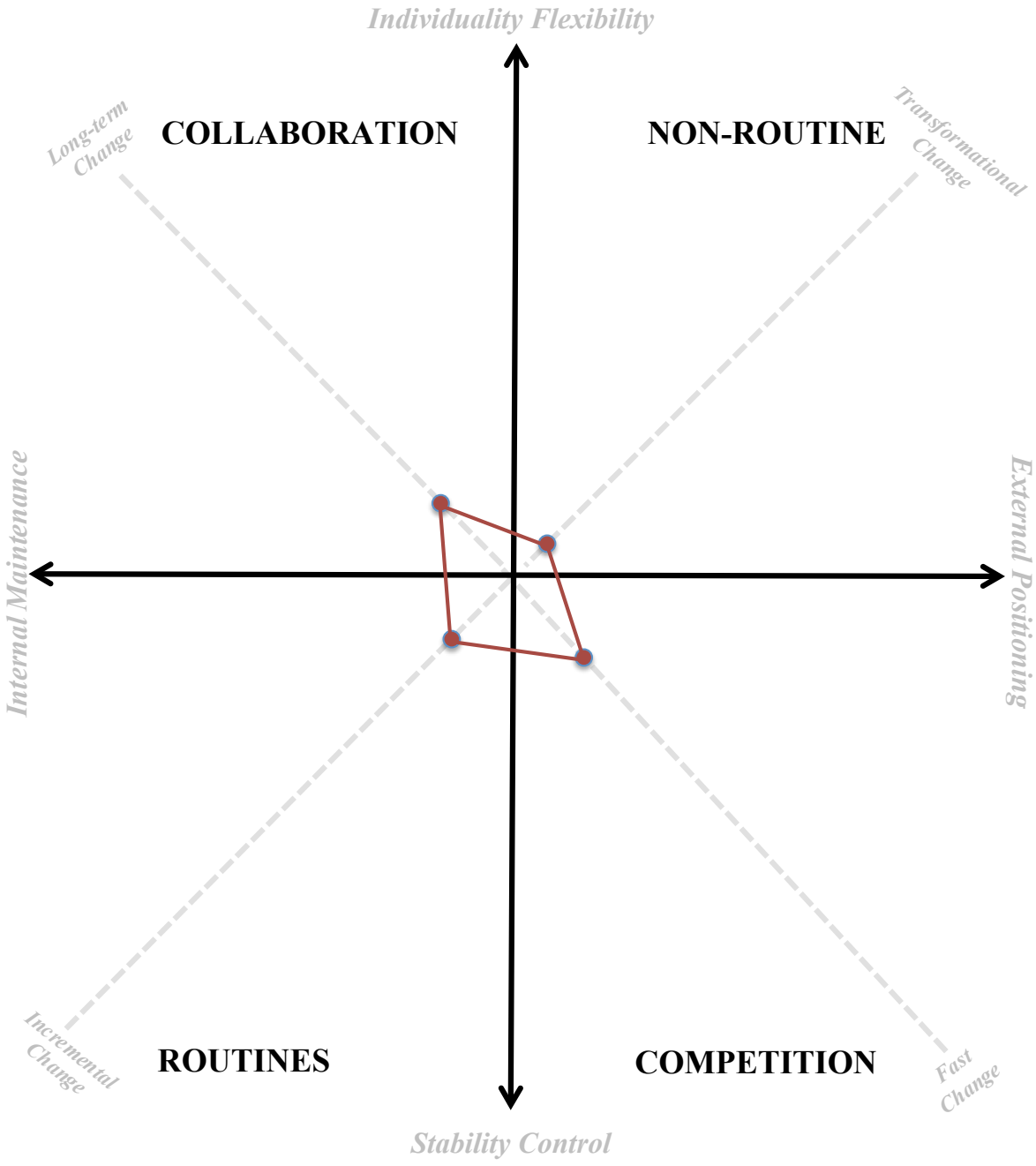


Figure 23. Competing Values Framework for the Faculty Recruitment and Hiring Process Reflecting the Diversity Ethos of Environmental Sciences Via Decision-Making Processes

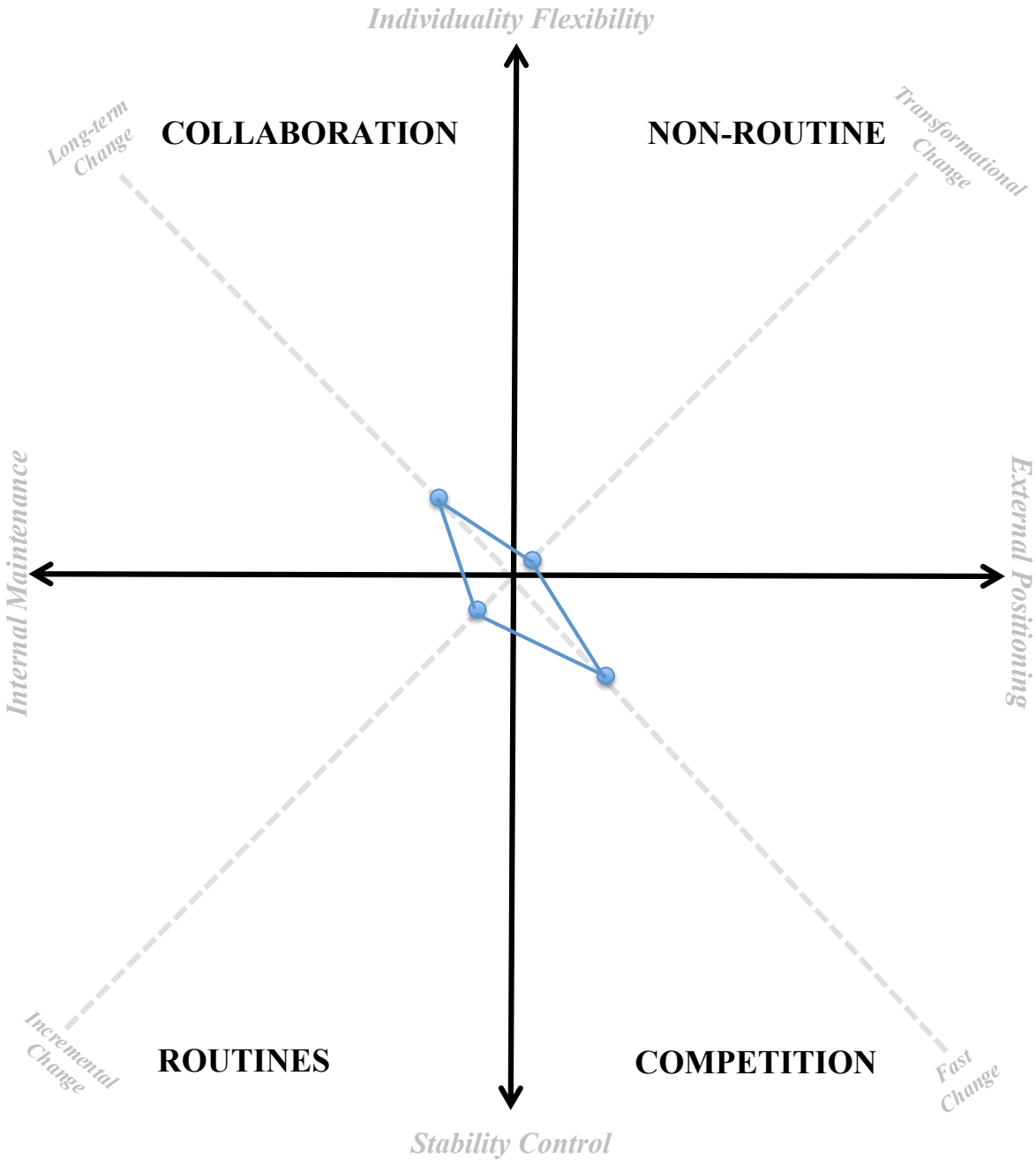


Figure 24. Competing Values Framework for the Faculty Recruitment and Hiring Process Reflecting the Diversity Ethos of Information & Library Sciences Via Decision-Making Processes

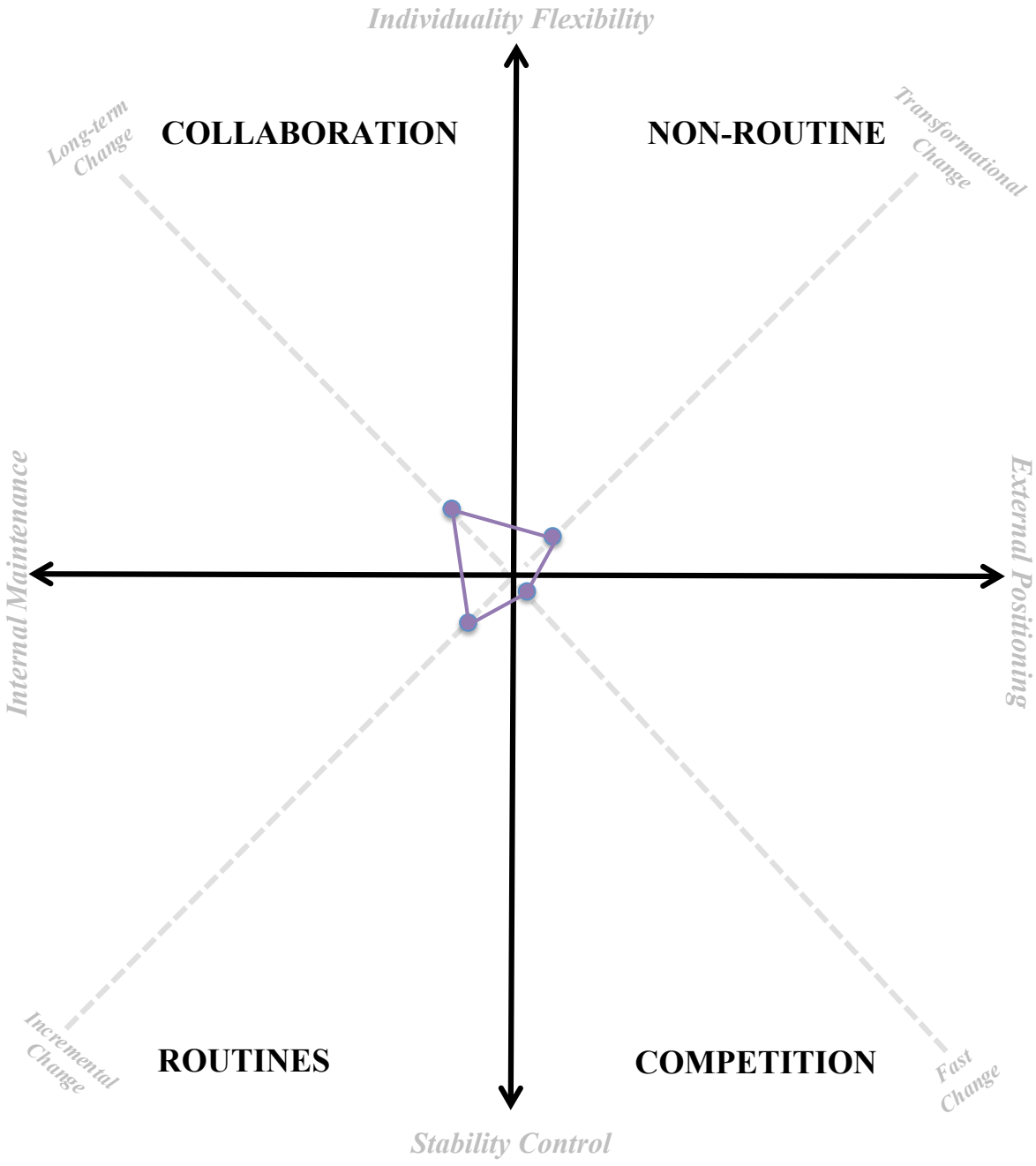
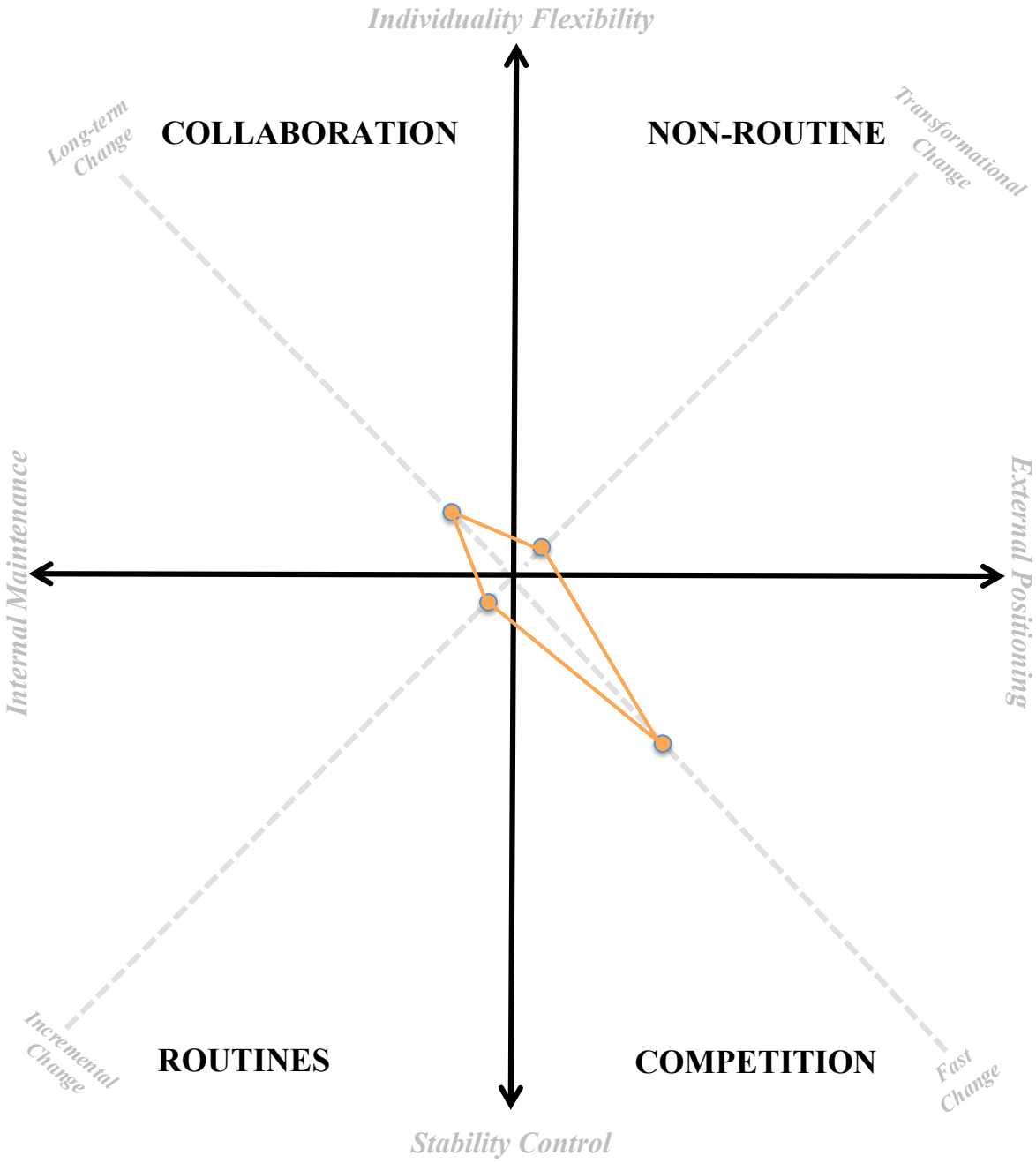


Figure 25. Competing Values Framework for the Faculty Recruitment and Hiring Process Reflecting the Diversity Ethos of Physics Via Decision-Making Processes



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