

STARTING AT THE CROSSROADS: INTERSECTIONAL APPROACHES TO INSTITUTIONALLY SUPPORTING UNDERREPRESENTED MINORITY WOMEN STEM FACULTY

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In this paper we investigate the opportunities and challenges that emerge from an intersectional approach to achieving equity through institutional change, focusing particularly on the persistent lag faced by underrepresented minority (URM) women in U.S. academic science, technology, engineering, and mathematics (STEM) fields. Our specific goals in this paper are twofold: (1) to contribute to current theoretical models and research on enabling URM women in academic STEM fields, and (2) to advance broader current discussions concerning how intersectional approaches might be applied to shape institutional transformation. In order to do this, we first explore the historical and context-specific issues that illustrate how the relative lack of progress made by URM women faculty in STEM is at least partially driven by institutional structures that cannot fully address the experiences of persons with multiple subordinated identities. We then employ current literature on intersectionality and organizational change to theorize four ways that intersectional approaches might specifically help shape more successful institutional interventions. By offering some possibilities presented by an intersectional approach to institutional transformation, we suggest helpful starting points for mobilizing intersectionality in the service of structurally supporting the advancement and success of URM women in STEM.

KEY WORDS: *intersectionality, STEM, underrepresented minority, gender, women, race, institutional change*

1. INTRODUCTION

Our work focuses, in particular, on expanding conversations about the specific opportunities and challenges presented by a feminist, intersectional approach to supporting underrepresented minority (URM) women through institutional transformation (Crenshaw, 1989; Collins, 2008). We first explore the context-specific issues that illuminate how the relative lack of progress made by URM women faculty in science, technology, engineering, and mathematics (STEM) fields is partially driven by institutional structures that neglect the experiences of persons with multiple subordinated identities. We then employ current literature on intersectionality and organizational change to theorize four ways that intersectional approaches might specifically help shape suc-

cessful institutional changes for URM women faculty in STEM. By offering some examples of the challenges and opportunities presented by an intersectional approach to institutional transformation, we suggest helpful starting points for mobilizing intersectionality in the service of progressive institutional change.

2. URM WOMEN IN U.S. STEM FIELDS: MULTI-MARGINALITY AND THE LIMITS OF CATEGORIES

For the purposes of this paper, we have used the definition of URM women employed by the National Science Foundation (NSF) ADVANCE Program, which seeks to promote success for women in academic STEM fields. The ADVANCE Program's definition for URM women in STEM focuses on "women of diverse characteristics and backgrounds including, but not limited to: race, ethnicity, disability status and sexual orientation" (NSF, 2015). We are aware that the groups we examine in this paper exist within a specific cultural context and are largely defined by meanings organized through categories of difference that are often at least partially specific to the United States. Historically, race and ethnicity have been the dominant categories of difference in the United States and have been shaped by specific legacies, such as slavery and segregation (African Americans), the history of immigration and labor (Latina/o, Chicana/o, and Asian Americans), and ethnic cleansing/genocide (Native Americans). Women in these groups are often referred to in aggregate as women of color; however, there are significant differences in terms of identity and experience across that aggregate term. Along with race/ethnicity, U.S. religious conservatism has (for example) shaped the experience of lesbian, gay, bisexual, and transgender (LGBT) people, as have the particular cultural understandings around (lack of) access that shape dis/ability. We are mindful that all nations and cultures are characterized by specific definitions of minority status, and such groups are therefore always constituted in culturally and historically specific ways.

When we turn to examine the status of URM women in STEM—generically defined by these categories—we see a disturbing trend. Over the last 10 years there has been a slow but steady increase in the number of female faculty in STEM education fields (Burrelli, 2008; NSF, 2014). The overall percentage of faculty women in the physical sciences increased from 16% in 2001 to 22% in 2010; in engineering the percentage increased from 8% to 16% (NSF, 2004; 2013). However, hidden within these encouraging trends are some troubling patterns. Despite the growing number of doctoral degrees in STEM fields awarded to underrepresented racial/ethnic minorities, the percentage of women of color in academic STEM fields has, in fact, decreased (Asian-American women are the exceptions) [National Science Board (NSB), 2012]. The lack of correspondence between the number of actual faculty and the number of Ph.D. degrees awarded can be observed in several fields. Using African-American woman as an example, in 2006 there were 7000 computer science faculty and only 60—less than 1%—were African-American women (Hill et al., 2010). However, between the years 2002 and 2005, approximately 2% of doctoral degrees in computer science were awarded to African-American women. Similarly, in 2007, African-American and Hispanic women were almost non-existent in physical science departments at top research universities (Nelson and Brammer, 2010). However, in the five years prior, these two groups respectively accounted for almost 4% and 1% of the doctorates in the physical sciences (NSF, 2011). In general, women of color in the United States continue to be underrepresented in STEM fields. In 2008, women of color collectively earned only 10.1% of doctorates

awarded in science and engineering, while their representation among 25–64 year olds in the general U.S. population was 16.5% (NSF, 2011). Because the overall number of women of color in STEM fields lags significantly relative to their representation within the overall population, this group (and other URM groups) continue to be identified as an “untapped source of domestic talent” for STEM fields (Ong, 2010, p. 8).

Because statistics on faculty women in STEM are often disaggregated only by race/ethnicity in the United States, it is difficult to identify trends for other minority groups; however, this pattern could hold for other underrepresented populations as well. For instance, at U.S. colleges, major enrollment trends for students with disabilities suggest that differently-abled women continue to be severely underrepresented in science and engineering fields (tellingly, there were no national data sources providing statistics on differently-abled female faculty as of 2010) (see Knapp, 2008; Lee, 2011; NSF, 2014). Overall, the data justify a heightened concern with the current lack of relative progress made by URM women in academic STEM fields.

This concern is contextualized by the extensive body of research on the challenges located at the junction between gender and minority status in the STEM context. These challenges were first brought to national attention in the seminal 1976 American Association for the Advancement of Science (AAAS) report, *The Double Bind: The Price of Being a Minority Woman in Science* (Malcom et al., 1976). Based on interviews and discussions with women of color in science, this pioneering report underscored the simultaneous experience of both sexism and racism that often strands women of color in less powerful positions relative to their male and/or White counterparts (Beoku-Betts, 2004). As highlighted by Beutel and Nelson (2006a) in their study of gender and the racial/ethnic composition of faculty at 650 top-ranked U.S. research science and engineering departments, there are more male than female faculty within each non-White racial/ethnic group for almost every discipline, particularly in engineering and the physical sciences, where 95% of full professors are men. STEM faculty members who are women of color are less likely to be awarded tenure than White faculty in the same disciplines and (of all groups) women of color are the least likely to get tenure (Beutel and Nelson, 2006a,b; Reif, 2010; Nelson and Brammer, 2010). Significantly, promotion trends of women of color do not reflect their actual productivity. As Jackson (2004) demonstrated in her survey of tenured engineering faculty at 19 top-rated research intensive universities, there are few to no differences in gender or ethnicity with respect to teaching or research productivity. The only distinction is with respect to service (Thompson and Dey, 1998). As Johnson and Lucero (2003) have described, there is a “cultural taxation” of junior faculty of color who are asked to serve on minority-serving and diversity-related committees and to advise minority students (formally or informally) in addition to fulfilling their teaching and research responsibilities. Data reported by the Massachusetts Institute of Technology (MIT) Initiative for Faculty Race and Diversity highlighted that at MIT a significant number of minority versus non-minority faculty leave before or at the associate level without tenure (Reif, 2010).

It is significant, too, that URM women have historically fit less easily than majority women into academic science settings (Bilimoria and Stewart, 2009; Clewell and Anderson, 1991). Difficulties include reports of self-doubt and isolation (Fassinger, 1996; Gregory, 2001; Turner and Myers, 2000), unwarranted challenges to their authority and competency (Harris, 2007; Pittman, 2010; Russ et al., 2002; Turner, 2002a), and the emotional toll of dealing with often multiple forms of discrimination (Morgan and Brown, 1991; Settles et al., 2006; Turner and Myers 2000). Low numbers of URM STEM faculty women occur at both the points of recruitment (where perceived biases in the hiring process occur) and retention (Turner et al., 2008).

In one of the most extensive studies of racial/ethnic minority STEM faculty, MacLachlan (2005) interviewed 158 minority faculty members with Ph.D.'s, who graduated from the University of California system from 1980 to 1990. In this study, she found that "minority women tend to disappear among aggregates of all women, or all members of a particular ethnic group" (MacLachlan, 2000, 2001). Because they frequently work as the only minority woman and/or only URM in their STEM department (particularly in engineering and physics departments), STEM women who are also racial and ethnic minorities "fall through the cracks" and are left to negotiate American academic science cultures on their own (MacLachlan, 2001). Feelings of tokenism, isolation, and chilly climate lead many to leave academia (Blackwell et al., 2009; Turner and Myers, 2000). Addressing what has changed since "the double bind," Malcom and Malcom (2011) wrote, "much has changed, and much has not changed... Now it is less about rights versus wrongs and more about support versus neglect" (pp. 162–163).

While the double bind study and subsequent studies have addressed issues pertaining to women of color, issues of supporting URM women in STEM cross many additional categories of difference. For example, lesbian, bisexual, and transgender (LBT) women share the experience of gender-based discrimination, disadvantaging gender schemas, and/or sexism with all women. However, these women also face specific forms of discrimination engendered by a heterosexist, homophobic society (Morgan and Brown, 1991; Liddle et al., 1998). As a result, many LBT women report staying "closeted" or restricting their interactions with colleagues to avoid or minimize discrimination (Driscoll et al., 1996). In one of the few studies to specifically address LBT faculty in STEM fields, Bilimoria and Stewart (2009) found that many of these faculty members avoided revealing their sexual orientation at work, particularly during the early stages of their career. This self-compartmentalization and vigilance around self-disclosure on the job creates emotional and psychological stress (La Sala et al., 2008; Fassinger 1996) and often affects job satisfaction for LBT women (Bradford and Ryan, 1987; Fassinger, 1996). Clearly, the data support the contention that the active combination of being female and the URM status effects who enters, remains, and succeeds in academic STEM fields.

This "multi-marginality" for women of color, LBT women, women with disabilities, and other minority women also means that the issues specific to these women often go unseen. However, despite evidence that identities are mutually constitutive features and experienced as such identity categories are commonly tracked as discrete categories, creating a conceptual distinction around URM groups and producing a structural hurdle for thinking about members of multiple subordinate groups. This approach has been cogently critiqued by scholars who have called for approaches to data collection and policy analysis that reflect intersectional experience (Parken, 2010; Dahmoon and Hankivsky, 2011). However, despite these calls, this discrete category approach persists in the United States, particularly in the case of gender and race/ethnicity. As Leggon (2006) has explained, "This [separate] focus [on gender and race] is due in part to the way data on the science work force have been traditionally collected: by race/ethnicity OR sex, but not by race/ethnicity AND sex. This both reflects and reinforces the invisibility of minority women in science" (p. 325). Census Bureau Reports confirm that, in the U.S. context, STEM labor force data consistently separate gender from race (Landivar, 2013).

Because of this approach to data collection on the U.S. STEM workforce, analyses of and interventions in underrepresentation in STEM have been routinely framed in terms of women and/or underrepresented groups. Therefore, research on the STEM workforce tends to focus on women or racial/ethnic minorities without acknowledging overlaps within these groups or, im-

portantly, taking into account the bidirectional influence of multiple identities on shaping single individuals' experiences. We suggest that the lack of progress of URM faculty women in academic STEM fields (understood relative to majority women in STEM fields) results from the kinds of issues and challenges that emerge when conceptual and data-collection structures fail to take into account the forms of disadvantage experienced by persons who are characterized by multiple subordinated identities.

3. ADDITIVE VERSUS INTERSECTIONAL: THE INHERENT CONSTRAINTS OF “ADD UP” AND “TRICKLE DOWN”

The significance of the connections between gender and other elements of URM status for women in STEM is well documented. Early feminist work on gender inequality has already illuminated the effects of race/ethnicity on gendered experience for women of color in general (Turner et al., 2011; Bowleg et al., 2008; Collins, 2008; Dill, 1983; Moraga and Anzaldúa, 1981) and in STEM fields specifically (Adler et al., 1995). Hanson (2004) noted that constructions of gender in non-White ethnic/racial communities may not be the same as those in White communities. Therefore, gender systems associated with (for example) African-American culture may provide a distinctive backdrop for understanding the science career experiences of Black women.

Moreover, feminist researchers have productively expanded their areas of investigation to include the intersection of gender with other aspects of identity in STEM fields, such as transnational issues (Beoku-Betts, 2004) and sexual orientation/gender identity (Bilimoria and Stewart, 2009). Thus, for example, specific aspects of the social and legal systems can uniquely influence the work/family experience of STEM LBT women faculty who cannot assume partner legitimacy and work-related benefits—two significant advantages that are routinely taken for granted by partnered heterosexual working women (Bilimoria and Stewart, 2009; Morgan and Brown, 1991). The research on URM women in STEM highlights a dynamic in which some cumulative disadvantages accrue to people with multiple subordinated-group identities (Purdie-Vaughns and Eibach, 2008).

However, while the urgency of addressing multiple marginalities intensifies as marginalization increases, institutional forms of redress and climate change regularly employ a customary “single target” approach, particularly in the United States. In turn, that approach often results in an organizationally additive mode, in which the disadvantaging effects of different aspects of identity are summed together (Almquist, 1975; Epstein, 1973). Under the additive method, organizations take into account different kinds of URM status by adding categories of concern as new populations come to light or when new groups are identified by the institution as underrepresented. The desired outcome is that the cumulative effects of separate institutional initiatives will combine to adequately serve the needs of all URM faculty members. Such an approach might, for example, recognize that “women” and “people of color” are underrepresented in STEM fields and could, in response, create both a mentoring program for women STEM faculty and sponsor networking lunches for STEM faculty of color. The expectation would be that an African-American woman in STEM could take advantage of both groups. Or an institution might, as part of inclusivity efforts, offer lunches to discuss campus climate issues and also pass a same sex partner benefits policy. The assumption is that a Latina lesbian in a STEM field would take advantage of these separate initiatives. Institutionally, under the additive model, programming and policy efforts aimed at

institutional change are added as new populations are recognized and the institution works toward taking into account their particular needs.

Intersectionality theory (Crenshaw, 1989; Collins, 2008; Zinn and Dill, 1996; Glenn, 1999) provides a conceptual model for critiquing the additive model and articulating the mutually determining relationships that exist between gender and other aspects of social identity, particularly those aspects associated with URM status. In doing so, an intersectional perspective moves toward helping to articulate the “invisible” position of people who experience multiple disadvantaged statuses. Originally emerging from feminist work in Black and gender studies, and currently understood as both theoretically and empirically significant within a broad range of the humanities and social sciences (McCall, 2005; Choo and Feree, 2010), intersectionality theory posits that gendered experience can only be fully understood relative to other aspects of personal and social experience (Hancock, 2007; King, 1988; Collins, 1993; Warner, 2008). An intersectional model of analysis holds that gender-related issues cannot be fully or accurately addressed (at the individual, social, or institutional levels) until investigated in the full context of any individual’s or group’s social location, that is, relative to other intersecting and pertinent aspects of social identity (Bowleg, 2008; Crenshaw, 1989; 1991). It is this recognition of the synergy between aspects of subordinated identities that is at the heart of an intersectional approach to understanding and empowering URM populations in STEM. This approach emphasizes that isolating any single one aspect of identity (for example, gender or race/ethnicity), and then attempting to address that aspect, overlooks the ways in which that element’s meaning is fundamentally determined by other identity features. An intersectional approach seeks to incorporate the actual lived experience of individuals with multiple marginalization identities, recognizing that their experience spans multiple categories in a dynamically interconnected way and acknowledging that solutions for addressing URM status must take into account these active links.

Recently, scholars have enriched intersectionality theory by calling for an extension of intersectionality from the more conceptual realms into the fields of policy making, politics, and institutions. This emergent work focuses on the possibilities for, and challenges of, enacting intersectional approaches as they enter these organizational realms (Verloo, 2006). These scholars have argued that issues embedded in the practical application of intersectionality require engaging not only with identities but also institutional structures—and, explicitly, with the complex ways identities interact within given structural contexts (Hancock, 2007; Feree, 2009; Choo and Feree, 2010; Verloo et al., 2011). This recent work has highlighted the need for understanding intersectionality in its experiential and structural complexities, including the dynamic and situational nature of intersectional identities themselves.

Part of the urgency articulated by these scholars finds its roots in the profound erasures that take place when policy is developed in an “additive” mode and intersectional perspectives are not structurally taken into account. Purdie-Vaughns and Eibach (2008) argued that attempts to institutionally address issues faced by persons with multiple subordinate identities by offering single-identity programs may lead to organizational intersectional invisibility. One important form of intersectional invisibility occurs when interventions aimed at supporting URM women fail to create institutional spaces where complex, intertwined subordinations can be sufficiently articulated. In this case, the distinct needs of those persons who stand at the junctures of multiple URM identities are effectively erased. These particular individuals are, of course, typically members of highly vulnerable populations and therefore often the persons most in need of effectual support through successful URM-related programming and policy change. Purdie-Vaughns and Eibach (2008) argued that while traditional advocacy groups intend to represent the needs and

concerns of all of their constituents within an institution, they typically devote less attention and resources to constituents with multiple subordinate identities because they may believe that benefits targeted at constituents with a single subordinate identity (e.g., people of color or women) will “trickle down” to help those constituents who experience multiple marginalization identities (e.g., women of color) (Strolovitch, 2007).

However, because identities are not experienced vertically and independently but rather horizontally and simultaneously, there are limits to the trickle down policy approach. In the case of URM women in STEM, some examples illustrate how “inclusive spaces” and policies may inadvertently promote intersectional invisibility for URM women in STEM:

- Women of color may be seen as a uniform group and therefore institutional remedies associated with URM status may unintentionally create new forms of marginalization. For example, institutions may assume that Asian-American women in STEM do not experience racism because there is a proportionally representative number of that group in the STEM labor workforce.
- Differently-abled women in STEM who report workplace climate issues (such as inequitable treatment because of their gender or race) may have those instances of inequitable treatment automatically attributed to their disability status rather than to dynamics associated with sexism or racism.
- Programs designed to create supportive community for women in STEM may be locations of intense stress for LBT women because they produce a dilemma where such women must either expand efforts to mask their sexual orientation/gender identity or “come out” to colleagues. Efforts intended to address work/life balance may result in increased marginalization for LBT women.

Hence, while the research on URM women in STEM has recognized double bind phenomena, intersectionality takes such concerns further in terms of both theory and practice, adding new dimensions to our understanding of the experiences of people with multiple subordinated statuses and how institutions and policies may address (or fail to address) the structural dynamics that shape the experiences of women URM STEM faculty.

Intersectional perspectives can reveal two-way connections between identity and institutional structures, enabling (1) a clearer view of the systemic drivers of inequality via the experience of group membership(s), and (2) a better sense of how group membership aligns with systemic drivers of privilege or disadvantage. Hence, institutional attentiveness to intersectionality should not only focus on capturing or and revealing new groups (i.e., African-American women or disabled LBT women in STEM)—although such visibility is very likely a valuable outcome—intersectionality also requires that institutions strive to recognize and understand the complex processes of exclusion/inclusion and develop policy with nuance.

4. HITTING THE MOVING TARGET: INCLUSIVITY AND/VERSUS INTERSECTIONALITY

Research consistently indicates that when institutions consider the intersection of gender and

URM status through practices such as targeted hiring efforts, cultural- and identity-specific mentoring programs, or access to identity group-specific professional networking opportunities, URM women feel they “matter” and are more likely to thrive professionally (Blake, 1999; Bova, 2000; Kayes, 2006; Thomas and Hollenshead, 2001; Turner, 2002b). However, despite the documented value of addressing multiple disadvantages for women in STEM-related fields and our considerable knowledge about challenges faced by URM individuals, intersectional approaches remain relatively rare, particularly in terms of institutional responses. Why?

We suggest that intersectionality is an underused organizational approach because it demands a comprehensive rethinking of the fundamental conceptual underpinnings upon which strategies for improved institutional inclusivity typically rest. Organizational models for inclusion have classically focused on the identification and addition of systemically excluded groups, especially in the United States, where an “identity politics” approach is common and institutional change is strongly influenced by the discourse of “protected groups.” This approach assumes both a normative center (which does the including) and a set of underrepresented or protected groups (which are to be included). This model for change relies on group identity as delineated through specific categories—certain groups (women, non-native people, and non-visibly disabled people) are understood as systemically disadvantaged and/or underrepresented, and efforts are then made to incorporate those groups. The ultimate (well-intentioned) goal is to work against structured discrimination by supporting the success of the formerly excluded group such that it becomes substantive in size and sustainable in its presence.

We posit here that an intersectional approach to successfully supporting URM women in STEM is difficult to conceptualize and challenging to implement because it transforms a fairly clear set of groups into a moving target in which group stability is less apparent. For example, if the experience of being a female in STEM fields is constantly modulated by other aspects of another subordinated identity, then the “women in STEM” group ceases to be a stable group with common shared experiences. The effect of this approach is that the needs experienced within a cohort of faculty called “URM women in STEM” increase and become more difficult to address.

However, although current institutional approaches to addressing the concerns of URM women in STEM do not easily lend themselves to a fully intersectional approach, we believe it is possible to begin to create intersectionally informed models for institutional change and organizational action that complement current stable-group inclusion identity models. While the standard model for organizational diversity seeks to add new groups, an intersectional model requires sensitivity to how aspects of identity combine to create complex subjectivities. We argue that it is necessary to use both these approaches to develop conceptual strategies in order to think about how institutional change directed at diversifying STEM fields might accommodate a more situational understanding of identity, as well as a relatively fixed one that is characterized by the recognition of identity attributes associated with URM women.

If institutions recognize that femaleness and URM status are mutually determining experiential factors, hitting the moving target through organizational change brings to the table new implementation challenges. An intersectional approach will potentially expand our strategies for inclusion and climate transformation, not by replacing current strategies but by adding another lens through which organizations can re-imagine programs and policies as inclusive of their most vulnerable members. For example, the QUING project (<http://www.quing.eu/>), which compared gender equality policies across Europe and focused extensively on intersectionality, provides particularly rich theorizing and data regarding how gender inequality and other forms of inequal-

ity might intersect in the policy realm. The work of the QUING project provides an excellent example of conceptualizing how intersectional perspectives and policy might meet.

5. INTERSECTIONALITY AND INSTITUTIONAL TRANSFORMATION IN STEM: OPPORTUNITIES FOR ORGANIZATIONAL CHANGE

Because social/organizational environments are structured, it is possible to restructure them (Fox, 2010). Organizational change research also shows that change strategies can be implemented across multiple institutional frameworks, illustrating that there are many potential “entry points” for effecting transformative policy (Bolman and Deal, 2008). We contend that while there are challenges to implementing an intersectional model, there are also opportunities involved in employing such an approach to institutional change. We have identified four broadly defined areas where implementing intersectionality as a means of empowering and supporting URM women in STEM may, in fact, offer promising opportunities to creatively implement new strategies for organizational change.

5.1 Implementing Intersectionality: Opportunity #1

An intersectional approach can helpfully expand an organization’s paradigms for conceptualizing institutional change, such as offering ways to rethink identity categories or highlighting the importance of local context. As we have illustrated in Section 1 of this paper, the data show that normative, single group-based strategies for inclusion have not been effective in proportionally supporting the success of URM women in STEM. One particularly useful concept that intersectionality brings to the table is the distinction between master and emergent categories (Warner, 2008). Master categories (such as gender) are broad and characterized by distinct markers (biological differences for gender; economic processes in the case of social class) (McCall, 2005; Yuval-Davis, 2006); emergent categories are associated with compound effects, and their meanings can be understood as highly contextual rather than fixed. The distinction between master versus emergent categories has led some researchers to advocate for a “both/and” approach in order to expand an institution’s models for thinking about change (Bowleg, 2008; Risman, 2004).

Specifically for URM women in STEM, these two kinds of categories allow institutional change agents to distinguish between ongoing efforts (addressing a familiar universal category such as gender) and more contextual efforts. This allows distinctions to be made between categories we normally seek to include in STEM fields and the particular local, intersectional needs of any URM female population. This leads to the insight that women with multiple URM identities may have needs that are, in and of themselves, powerfully structured by a certain local context. Hence, conscious attentiveness to emergent identities not only reveals new populations, but enables a new level of attention to the specific institutional context in which an URM woman in STEM may work. Research on gender, intersectionality, and policy change conducted by the Canadian Research Institute for the Advancement of Women supports this claim, noting that intersectional institutional approaches are inherently “locational, situational and particular rather than universal” (Bunjun et al., 2006). As such, intersectional approaches to institutional change integrate URM issues with critical local questions. Thus, an intersectional perspective would ask what it means for policy if one is an African-American woman scientist in a state with explicit anti-affirmative action or non-quota policies, or a lesbian engineer at a conservative, religious

institution, or a differently-abled female STEM faculty member at an under-resourced university. Because of local emphasis, intersectional approaches may motivate institutions to undertake self-studies in order to become more aware of local issues that structure the specific climate for URM women in STEM. We posit that this kind of sophisticated analysis will lead to better solutions for URM women because they will attend to the particular climate in which an URM woman in STEM is attempting to thrive.

5.2 Implementing Intersectionality: Opportunity #2

An intersectional perspective can potentially identify new groups, including structural sites of systemic group privilege, which in turn may lead to new insights for the organization. While intersectionality may appear to invite “infinite variation” and suggest an ever-growing number of very small categories, it is important to recognize that new variations in identity emerging from such an intersectional perspective may inspire new insights and perspectives on institutional change. As Davis (2008) noted, it is the “infinite regress built into the concept—which [identity] categories to use and when to stop—[that] makes [an intersectional approach] vague, yet also allows endless constellations of intersecting lines of difference to be explored. With each new intersection ... previously hidden exclusions come to light” (p. 77). It is possible to understand the categories potentially produced by an intersectional perspective as a means by which new insights can be gained.

Of course, institutional efforts to address issues of URM women in STEM are classically plagued by a “small N ” problem, in which the small populations of URM STEM women in any group can make identification of pertinent issues difficult (and may amplify dangers of marginalization or increase vulnerability). If efforts at increasing the low numbers of URM women in STEM are often paradoxically impeded by the low numbers of URM women in STEM, this conundrum is precisely why more creative attentiveness to intersectionality groups is crucial—and why such attentiveness may require that we re-conceptualize learning about difference and imagining institutional change.

In this context, it may be of value to recognize that the intersectionality model invites us to consider not only multiple marginalization identities, but also that the complex interactions between aspects of identity can lead to privilege as well as disadvantage. Intersectionality invites institutional change agents to consider the role of an extremely “large N ”: that is, individuals who profit from multiple systemic advantages (in the U.S. context, these groups would include heterosexuals, men, abled persons, and Whites) and consider ways to better recognize how privilege functions institutionally (Cole, 2009). Although it is commonly associated with drivers of structural disempowerment, intersectionality also suggests that institutions must work harder to understand the often subtle ways in which privileged identities are systemically empowered, and to think specifically about how the distribution of privilege is structurally organized. Privileges attached to those who occupy mythically “neutral” identities can be obscured by an inclusivity approach, and unearned structural advantages may be less visible. An intersectional perspective invites an examination of privilege that exposes the “other side” of the organizational structures of power that deeply affect the experience of URM women in STEM, possibly making those dynamics more visible and susceptible to change.

5.3 Implementing Intersectionality: Opportunity #3

Intersectional perspectives can broaden and improve the data gathering and measurement models for imagining, defining, and tracking desirable change. Setting specific goals and measuring

success constitute essential aspects of creating successful institutional change. Group-based data help us to measure where we are and where we wish to go and are manifest in many ways, from strategic planning to mandated data collection such as equal employment opportunity data in the United States. However, institutional change is often driven by empirical data that rely only on single-identity groups, and as we have demonstrated this mode of tracking populations creates a system whereby the particular presence and needs of URM women in STEM may fall between the definitional cracks. Therefore, it is important to recognize differences in data collection, and to note that in contexts such as in the United States, where gender data are separated out from other descriptors, there is much to be learned from the data collection practices of other countries (such as those in the United Kingdom).

An intersectional approach also reveals additional limitations of standard forms of institutional data collection at the category level. For example, categories themselves cannot accommodate fundamental differences between kinds of differences, i.e., place of origin cannot change over time but disability status can. Categories can also perpetuate and strengthen a hierarchy where some differences may be valued over others and where some characteristics are tracked (race, gender) and other forms of difference (sexual orientation, disability) are less frequently considered, if at all. URM population data collection often articulates certain categories as institutionally desirable and, through omission, marks others as less significant. As an institution attends to one URM group but not another, an URM woman in STEM could be both recognized as a member of a “desirable” minority population and erased. Clearly, standard forms of data collection are limited in their use, suggesting that efforts at an intersectional approach to data collection may be well worthwhile (Hankivsky and Cormier, 2009).

If a key element for institutional change involves evaluating the current climate, setting target goals for inclusivity, and measuring change relative to these data, the blurring and overlapping of groups that an intersectional perspective entails makes the work of quantitatively setting goals and tracking progress more difficult. As McCall (2005) noted, collecting data that intersectionally measure institutional conditions is difficult because it requires statistical approaches (such as multilevel, ecological, or contextual modeling) that are more complex than additive linear models and involve greater levels of estimation and interpretation.

Despite these challenges, collecting more nuanced data that reveal intersectional perspectives would be an investment in the well-being of URM women in STEM and in other vulnerable populations. The collection of qualitative data, in particular, would help institutions more effectively explore their needs around diversity. Research indicates that the narrative or case study model, a well-recognized method for social science research, produces particularly rich data—especially in terms of revealing heterogeneous perspectives and delineating experiential complexity (Ragin, 2000). It has been suggested that ethnographic data collection is, in fact, the single most effective way of illuminating the workings of intersectionality within an organization (Acker, 2012). One example of the kinds of sophisticated work done in this area is that of the intersectionality-based policy analysis framework, which “expands understandings of what is typically constituted as ‘evidence’ by recognizing a diversity of knowledges, paradigms and theoretical perspectives that can be included in policy analysis” (Hankivsky et al., 2012; p. 8). This study on widening data-collection practices when developing policy (Hankivsky et al., 2012) supports our claim that a broader-ranging, more complex means of data capture may facilitate intersectional policy development that is attentive to intersectional issues. The addition of qualitative data may support a better understanding of the experiences for URM women in STEM, adding layers of information to current information-collection and decision-making processes.

5.4 Implementing Intersectionality: Opportunity #4

Rather than weakening URM communities based on master categories (such as race or gender), intersectionality can be a complementary model that strengthens such communities and empowers their most vulnerable constituents. Distinct communities made of individuals with similar backgrounds and/or comparable experiences are sources of support and institutional power for structurally vulnerable URM women. Groups formed around shared identity and disadvantage can also be understood as important sources of emotional and intellectual strength for URM people (Crenshaw, 1991). Because of its multiple-factor approach, intersectionality could be understood as complicating the parameters of group membership, and hence disrupting community coherence and focus.

However, rather than seeing an intersectional approach as disruptive to URM communities, it is possible to understand it as strengthening such communities by illuminating connections to other groups and issues across an institution. Intersectionality does not invalidate shared experiences based on single-category association. However, it does offer a way to alleviate the ways in which “ignoring differences *within* groups contributes to tensions *among* groups” (Crenshaw, 1991, p. 1242). Greater attentiveness to connections between aspects of identity might also enable groups to avoid participation in the “Oppression Olympics,” a phenomenon in which identity groups vie to articulate their needs as most dire in order to access available structural and institutional resources (Martinez, 1993; Hancock, 2011). Understood in this context, an intersectional institutional approach to empowering URM women in STEM may constructively reveal links among categories, strengthening the institution’s ability to address areas of concern by articulating connections between categories and communities traditionally articulated as separate.

Also relative to established master category communities, intersectional approaches may increase institutional sensitivity to how inclusivity practices must change as URM faculty experiences differ. While some groups and communities are often traditionally built around raising visibility, some URM groups may not be readily visible (for example, disabled women) and/or visibility may comprise a form of disadvantage (for example, LBT women). Because it is not oriented toward a single attribute, intersectionality can take into account “differences among differences,” a characteristic that is considered a hallmark of effective institutional inclusivity work (Tuitt, 2010). Intersectional perspectives require that organizations imagine various kinds of URM status as having different structures, and therefore forming different kinds of communities or forming communities in unfamiliar ways. From this perspective, intersectionality broadens institutional thinking about different kinds of URM status, suggesting that resources may need to be devoted to creatively rethinking institutional inclusivity along the lines of specific institutional “nexus points” rather than policies directed at “certain kinds of people.”

Finally, and critically, an intersectional perspective may help us rethink the role of an institution’s most vulnerable constituents. As Turner et al. (2011) have shown, URM women in STEM benefit directly from structures that bring them together, increase their investment in organizational change, and bolster their knowledge about campus structures and resources. This should alert us to the fact that an intersectional perspective may demand that organizational change agents create venues through which URM women can be recognized as primary change drivers and not secondary or passive recipients of change. For example, intersectionality articulates groups (such as URM women in STEM) who then can be understood as

institutional actors and creators of initiatives, rather than as “recipient target groups.” It is possible, too, that institutional approaches to change that are more reactive than proscriptive accommodate more complex, intersectional approaches to the needs of URM women in STEM (Warner, 2008). In light of this research, intersectionality helps us reimagine URM groups (single category and complexly intersectional) as active, institution-changing forces, and institutions as obligated to create platforms in which URM women in STEM can fully articulate their concerns and needs.

6. CONCLUSIONS

Because intersectional approaches address multiple forms of subordinate identity, they have the potential to suggest new insights into the seemingly intractable systemic dynamics that have long stymied the progress of many URM women in STEM fields. Because of the dynamic and integrated perspective it affords, intersectional approaches to institutional change offer new ways to untie the complex knot of structural inequality for women experiencing multiple marginalities, as well as being an innovative means of appraising the effectiveness of those strategies that have been developed to empower URM women in STEM.

Of course implementing intersectionality at the structural and policy levels is a complex and difficult matter: minority statuses—and their meanings—change in different national and historical contexts, and data collection may require resource-consuming subtlety and care. Additionally, intersectional approaches to institutional change do not always seamlessly mesh with given standard institutional practices for initiating organizational transformation. We are further sensitive to warnings that intersectionality should not be held up as a panacea concept in ways that mask the difficulties of implementation or the labor involved (Nash, 2010). Nevertheless, we consider intersectional approaches to institutional change to offer important opportunities for thinking critically about the limits of single target diversity models and to pursue new approaches for improving institutional inclusivity. Working to integrate intersectional approaches for empowering URM women in STEM clarifies the limits of historically dominant approaches, creates new mechanisms for recognizing privilege as well as discrimination, and offers new possibilities for imagining and implementing institutional transformation.

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