

THEORY-INFORMED RESEARCH TRAINING AND MENTORING OF UNDERREPRESENTED EARLY-CAREER FACULTY AT TEACHING-INTENSIVE INSTITUTIONS: THE OBESITY HEALTH DISPARITIES PRIDE PROGRAM

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Mentoring has been consistently identified as an important element for career advancement in many biomedical and health professional disciplines and has been found to be critical for success and promotion in academic settings. Early-career faculty from groups underrepresented in biomedical research, however, are less likely to have mentors, and in general, receive less mentoring than their majority-group peers, particularly among those employed in teaching-intensive institutions. This article describes Obesity Health Disparities (OHD) PRIDE, a theoretically and conceptually based research training and mentoring program designed for early-career faculty who trained or are employed at Historically Black Colleges and Universities (HBCUs). *Ethn Dis.* 2018;28(2):115-122; doi:10.18865/ed.28.2.115.

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INTRODUCTION

Significant racial/ethnic and gender disparities persist in biomedical and health professional disciplines^{1,2} despite the rapidly growing evidence highlighting the benefits of increasing diversity in multiple disciplines.³ A 2015 National Science Foundation (NSF)² report noted that women, African Americans, American Indians and Hispanics across the United States continue to receive doctoral degrees and academic appointments at rates substantially lower than their majority counterparts. Longstanding efforts to attract and retain more underrepresented racial/ethnic minorities (URM) and women into science and health professions appear to have made only a modest difference. One approach to improve diversity in the biomedical workforce is to engage with a largely overlooked pool of potential talent employed in teaching-intensive institutions.

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an important element for career advancement in many biomedical and health professional disciplines and has been found to be particularly critical for success and promotion in academic settings.^{4,5} The mentoring relationship between a more senior professor and an early-career faculty member is one in which a research veteran provides advice and support to his/her less-experienced colleague; however, mentorship can benefit and enhance the productivity of both mentee and mentor.⁶ Further, Boyington and collaborators⁷ assert that having a designated mentor can yield benefits for early-career faculty (ie, early research success, participation in formal career development programs) and their institutions (ie, retention of racial and ethnic minority faculty). Unfortunately, this intentional form of knowledge transfer is often less available to groups underrepresented in biomedical research as they are less likely to have mentors and receive less mentoring than their majority-group peers, even when exposed to mentoring programs.¹ The lack of mentoring or poor mentoring has been cited as a major source of racial/ethnic disparities in acquiring major grant funding, holding tenure-track positions

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in research-intensive settings, and meriting promotion and tenure.^{8,9}

National goals for diversity in the US biomedical workforce¹ are unlikely to be achieved without a significant investment in faculty training and mentoring. Lack of progress in workforce diversity can contribute to the persistent racial/

number and quality of diverse faculty who are more likely to have a passion for, and commitment to, reducing health disparities.¹¹⁻¹³

The NIH Biomedical Research Workforce Pipeline Report¹ noted that ‘mentorship’ was among the top three most frequently noted pipeline issues. A number of mentoring programs for minority scholars address diversity in the research workforce; however, few, if any, focus on faculty of color at Historically Black Colleges and Universities (HBCUs) and other teaching-intensive institutions. We believe that faculty in these academic settings are one of the key untapped resources that can directly enhance diversity in biomedical research, and indirectly through the impact on students, peers, and institutional environments, thereby opening and expanding the “health profession and research workforce pipeline.”⁸

Many existing research training and mentoring programs lack the conceptual or theoretical grounding and sufficient precision to successfully engage minority faculty in general, especially those at teaching-intensive institutions.¹⁴ We believe that social, educational, and behavioral theories can provide insights into the contextual factors that can improve the effectiveness of faculty mentoring programs associated with HBCUs and other teaching-intensive institutions. A solid theoretical foundation coupled with a conceptual model provides an organizing framework highlighting constructs critical for the development of effective mentoring programs that can help early-career faculty establish

and maintain a viable program of research. Such a framework may be particularly salient in the development of robust research training and mentoring for early-career investigators employed in teaching-intensive environments. The purpose of this article is to describe sociological, psychological, and educational theories that have informed the development and implementation of an obesity health disparities research training and mentoring program designed for early-career faculty who were educated at, or who are active faculty members at HBCUs.

THE OBESITY HEALTH DISPARITIES (OHD) PRIDE PROGRAM

The National Heart, Lung, and Blood Institute (NHLBI) Programs to Increase Diversity among Individuals Engaged in Health Related Research (PRIDE) is a multi-site research training and mentoring program for transitioning post-doctoral fellows and early-career faculty from backgrounds underrepresented in biomedical research (<https://www.nhlbi.nih.gov/research/training/PRIDE-research-programs>). Each program is offered by a different academic medical center and each addresses a particular area of emphasis related to heart, lung, blood, or sleep research.⁷ The programs are additionally supported by a Coordination Core that manages the competitive application process, collects cross-site baseline and longitudinal follow-up data, and organizes an annual research conference

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ethnic disparities in the nation's health.¹⁰ Underrepresented minority scientists conduct a significant share of the health disparities research in the United States, and contribute substantially to translating research findings to low-income communities and communities of color.¹⁰ Changing US demographic patterns, along with the increasing economic burden of health disparities, have contributed to an enhanced national interest in increasing the

for participants. The OHD PRIDE program based at the University of Mississippi Medical Center focuses on training and preparing junior faculty mentees who are graduates from or active faculty members at HBCUs to conduct disparities research in obesity and related areas. Individuals selected for this program are exposed to cutting-edge obesity research in combination with intensive one-on-one and group mentoring designed to enhance overall research productivity with peer-reviewed publications, the development of high-quality grant applications, general professional development, and guidance in career navigation. Early-career faculty mentees are guided by a nationally known and diverse group of dedicated and experienced mentors who either trained at, or have extensive experience working with HBCUs and/or other teaching-intensive institutions, as well as with research-intensive institutions. These mentors are uniquely prepared to support and work with trainees who seek to enhance their research careers while also being effective classroom educators and health care providers.

Most OHD PRIDE mentees hold faculty appointments at academic institutions where teaching is the primary mission but where research has become a more significant component in recent years.¹⁵ Regardless of institution type, developing and maintaining a program of research represents a considerable challenge for early-career faculty. However, those in teaching-intensive institutions have considerable educational and service responsibili-

ties, and often have minimal access to resources such as pilot funding or experienced research collaborators and mentors with a funding track record. These factors can disqualify them from consideration in mentoring programs in which institutional environment is a critical element of the candidate selection process. The utilization of research skills developed and sharpened through mentoring programs can be considerably affected by the environment in which individuals work; our OHD PRIDE program is grounded in theories that address structural and individual factors in collaboration with the specific institution in which the mentees are employed. Our program integrates key principles from *structuration*, *role strain*, *adult learning*, *self-determination*, and *persistence* theories into an established conceptual framework designed for faculty development programs in order to address the salient aspects of teaching-intensive institutions that can present challenges for building research careers.

THEORETICAL FOUNDATION AND INTEGRATION

Effective mentoring is a form of knowledge transfer to help individuals develop skills and navigate institutional environments.¹⁶ Structuration theory is founded on the premise that individual behaviors emerge from an interaction between structural and individual-level forces¹⁷ and provides insight into the opportunities and challenges associated with building a research

career in teaching-intensive institutions. Colleges and universities are structures with rules (eg, teaching loads) and resources (eg, research assistantships) that organize how individuals interpret their circumstances and generate methods for dealing with them.¹⁸ Role strain theory^{19,20} provides insight into the conflict, overload, or ambiguity experienced by minority faculty attempting to establish and maintain research careers at teaching-intensive institutions. Adult learning theory (ALT) advances a set of ideas about how adults learn new skills or information^{21,22} and introduces tools and techniques (eg, simulation-based learning²³) in which mentees can be actively engaged in the mentoring process and experience it in a cognitive and emotional fashion.

OHD PRIDE also incorporates tenets of two other theories: self-determination theory and persistence. Self-determination theory (SDT) presents an explanation for individual goal-directed behavior that portrays motivation as varying along a continuum with intrinsic motivation (doing something because it is inherently interesting or enjoyable) on the far right; extrinsic motivation in the middle; and “amotivation” (without any motivation) on the far left.²⁴ Persistence introduces two important elements for success in biomedical research and our approach to mentoring focuses on its primary determinants – learning and professional identification. Career advancement for diverse faculty at teaching-intensive institutions can be protracted; however, a strong network of committed

mentors;⁹ multicultural-focused career interventions;²⁵ and innovative mentoring practices⁴ can prevent stagnation by helping early-career faculty establish research identities, build robust research programs, and remain engaged in the academy.

OHD PRIDE CONCEPTUAL MODEL

Undergirded by structuration and role strain theory, OHD PRIDE integrates the persistence framework with ALT and SDT through a modification of the Compass Model of Faculty Development Programs.²⁶ Our adapted model maps out the interplay between self-determination and intrinsic and extrinsic forces for learning by modifying the Compass Model's four primary directions (N, S, E, W) and quadrants (NW, NE, SW, SE) to reflect issues relevant for research training and mentoring programs. The directions represent the perspectives (input) of various stakeholders (eg, faculty, administrators) that should be included in planning faculty development/research training programs. N reflects the qualities needed to be an effective researcher; E represents the core competencies required for individual faculty members; W mirrors the interests of individual academics; and S acknowledges the limited resources needed to support faculty training programs.²⁶

The OHD Compass Model also includes the domains of emotional and social intelligence within the competencies of perception, understanding, utilizing and manag-

ing one's own and others' emotions effectively, particularly to manage problems.²⁷ The growing literature on the science of team science has demonstrated that emotional intelligence is necessary for effective teamwork.^{28,29} While the development of visible skills (eg, grant and manuscript writing) are vital elements of research training programs, invisible skills (eg, empathy, self-awareness, integrity) are less frequently addressed but are increasingly critical in the environment of collaboration and team science. Taken collectively, we believe that the provision of research support, skills development, and emotional intelligence training, grounded in a keen appreciation of the target audience's unique work environment will result in the development of an effective research training program for minority faculty working in teaching-intensive institutions. (Figure 1)

DISCUSSION

Many research training and mentoring programs have been designed to increase diversity in the biomedical and health professions workforce but are mostly grounded in frameworks relevant to career success at research-intensive institutions. While there has been progress in the number of women receiving doctorates in STEM areas, much less progress has been noted for underrepresented minorities.² The 2011 groundbreaking report, *Race, Ethnicity, and NIH Research Awards*³⁰ found that African American applicants were 13 percentage points less

likely to receive funding than their White counterparts. Disparities in funding were also found at the institutional level, as 30 institutions received a disproportionate share of federal research funding. Further, racial and ethnic minority applicants demonstrated less persistence than their White peers as African American and Hispanic researchers were less likely than White investigators to revise and resubmit a grant application that was not funded the first time.³⁰ In addition, NIH recently re-assessed this issue and reported a continued funding gap in the award rate for first time NIH R01 applications from African American and White scientists between FY 2011 and FY 2015 (11% vs 17%) compared with the FY 2000 and FY 2006 (17% vs 29%) with race remaining a statistically significant independent factor ($P < .0001$).³¹ Further, Valentine and colleagues³¹ found that African American investigators submitted fewer initial R01 grant applications; received lower overall priority scores; resubmitted unfunded grants less frequently; and proposed topics that are less likely to be awarded (regardless of applicant race) more often than White investigators. Collectively, results from these studies suggest that African American faculty at HBCUs tended to be at a significant disadvantage as these factors combined to undermine the probability of having a successful research career.

It is also noteworthy that the contextual disadvantages faced by minority faculty at HBCUs may be exacerbated by limited research training experiences after earning

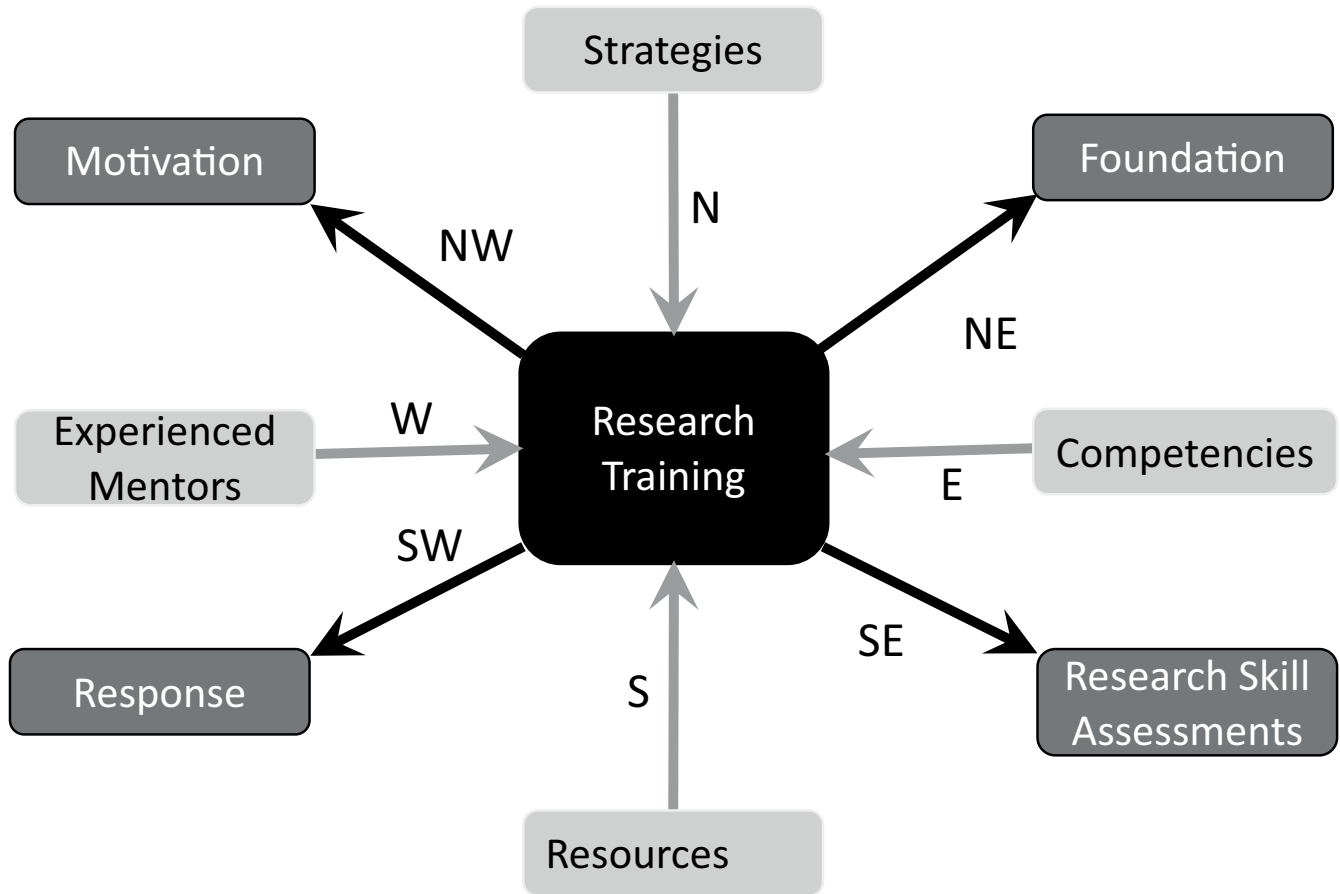


Figure 1. The Obesity Health Disparities PRIDE program's compass model.

Model Adapted from Al-Eraky and McLean.²⁶

a terminal degree. Data from the Ginther study³⁰ established that post-degree research training experiences (eg, postdoctoral fellowships) were positively associated with the quality of NIH applications and their likelihood of being funded. A recent study using a conceptual system dynamics model based on the hiring of assistant professors in the biomedical sciences, and positing no hiring discrimination, predicted that faculty diversity will not improve by the year 2080 unless there

are more minority with post-degree research training.¹¹ An effective means to increase faculty diversity in the biomedical research workforce may be to provide enhanced research training to the current cadre of research-interested faculty at teaching-intensive institutions.

OHD PRIDE is designed to address these challenges by providing junior faculty at teaching-focused institutions with an intensive research experience that will facilitate the development of focused programs of

research, punctuated by productivity in publishing peer-reviewed manuscripts and the submission of competitive grant applications. These faculty have considerable potential to diversify the biomedical workforce as they are in a unique position to serve as critical role models and to educate, encourage, inspire and otherwise affect large numbers of students to consider and prepare for research careers in the biomedical sciences and health professions.³²

Other factors that may under-

mine the development of talented minority students and scholars at different career stages, especially at research intensive institutions, include institutionalized racism, hostile climates, implicit bias, stereotype threat, micro aggressions, bias in selection decisions and other mechanisms.¹⁴ There is a press-

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ing need to increase institutional awareness and promote institutional change to eliminate these barriers and, more immediately, to increase research faculty members' awareness of their effects, skills in navigating around them, and ability to persist despite them.³³ Addressing this need requires research training and mentoring programs with mentors who are familiar with the culture of HBCUs and other teaching-intensive institutions and can generate and monitor reasonable career development plans for URM faculty within these environments.

Writing and publishing peer-

reviewed manuscripts is well known to be one of the challenges for URM faculty at both research- and teaching-intensive institutions. Yet, publishing scientific manuscripts is a critical part of the evidence required for reviewers' confidence in considering grant funding and for success in the tenure and promotion process. Given the importance of this academic activity, faculty members require effective ways to maximize their time to accomplish their writing goals. The OHD PRIDE program developed the Academic Break Cycle (ABC) approach for manuscript production to enhance the productivity of faculty with heavy teaching loads. This approach encourages scholars to develop writing projects that leverage scheduled breaks in accordance with their academic calendars and OHD PRIDE mentees have begun to publish successfully using this method.^{34,35}

Lessons Learned

Through the implementation of OHD PRIDE, we have found faculty research training programs to be most effective at HBCUs/and other teaching-intensive institutions when they are based on theoretical and conceptual frameworks and led by a team of mentors who are familiar with research-intensive institutions as well as the structure and culture of these environments. Our collective experience with HBCUs and teaching-intensive institutions has provided insights into some of the challenges facing current faculty; however, several important lessons have emerged over the last three years to refine our approach to fac-

ulty research training. Arguably, the most important lesson was that expectations regarding success require reconsideration and recalibration. Some faculty members in teaching-intensive environments may be one of the few in their department or college with research aspirations; they will have to educate their department chairs, deans and/or presidents about the fierce competition for grant funds, restricted space in reputable scholarly journals and their limited ability to compete without the benefit of additional training, protected time and a robust research infrastructure. Research training for this group of junior faculty will better position them to develop their own research portfolio over time and increase the exposure of their students to the rigor and the excitement of research. Finally, we anticipate that some faculty may be encouraged about the opportunity to pursue a career as an independent investigator leading research endeavors and ultimately becoming a nidus for expanding research at their institution and leveraging their success to inspire peers and students who may have similar aspirations.

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