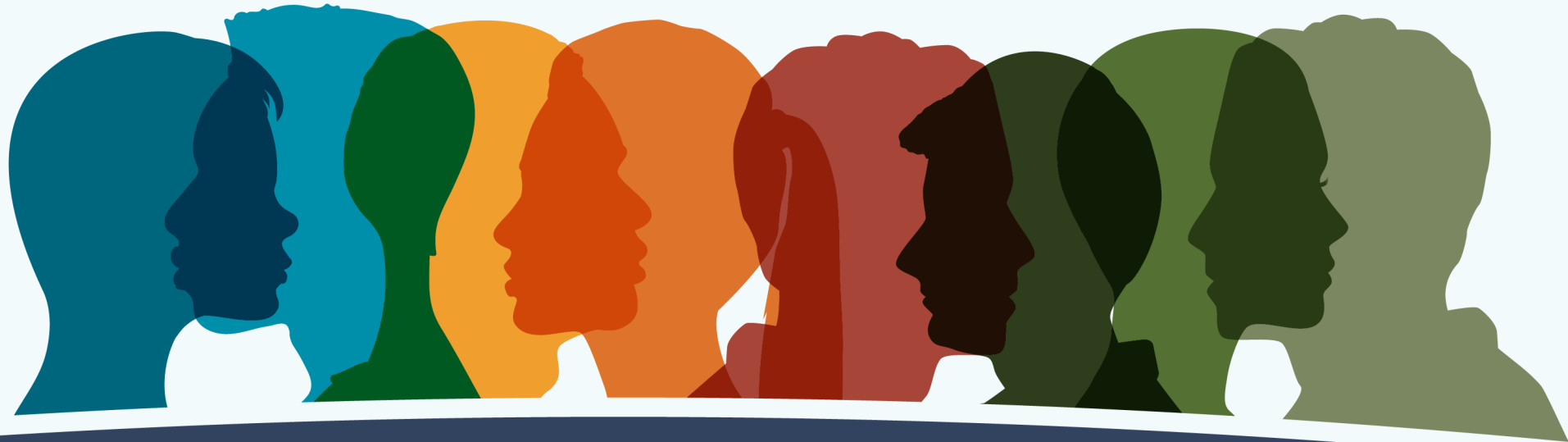


#SWDSS



NIH Scientific Workforce Diversity Seminar Series

How Do Research-Active Institutions (e.g., HBCUs, TCUs, and MSIs) Impact the Diversity of the Scientific Workforce?

Omar S. López, Ph.D.

November 30, 2023

QUESTIONS TO BE ADDRESSED

- What occupational artifacts undermine STEM workforce diversity?
- What can MSI research-active institutions do to overcome these occupational artifacts to increase STEM workforce diversity?

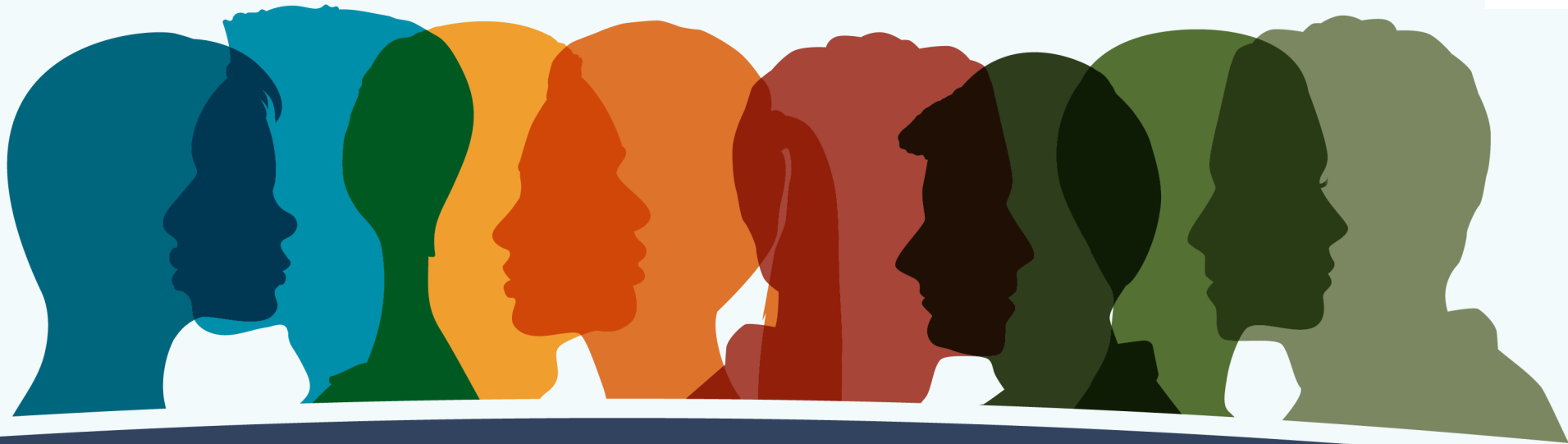
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NIH Scientific Workforce Diversity Seminar Series
MSIs within the Context of STEM Occupations

Omar S. López, Ph.D.

November 30, 2023



Data Sources:
2018 American
Community Survey

2019 Occupational
Information
Network (US DOL)

López, O. S. (2023). The determinants of wages among Americans with disabilities in non-STEM and STEM occupations. *Journal of Vocational Rehabilitation*, [Pre-press](#).

López, O. S. (2023). The determinants of wages among Black males in non-STEM and STEM occupations. *Journal of Women and Minorities in Science and Engineering*, [Forthcoming](#).

López, O. S. (2023). Bilingual competency in US occupations: Resetting expectations about language in American society. *Humanities and Social Sciences Communication*, 10(263), 1-11. Open access available at: <https://doi.org/10.1057/s41599-023-01769-w>.

%Wage Changes of Malleable Characteristics Compared to White Males*

Least Malleable	%Wage Change	Somewhat Malleable	%Wage Change	Most Malleable	%Wage Change
Age (years)	5.8	Hours/Week	9.0	Education	13.5
Hispanic	-5.8	Weeks/Year	29.4	STEM Degree	12.5
Black	-14.9	Public Sector	-3.0	STEM Occupation	28.3
Asian	5.2	Non-Profit	-9.0		
Other	-14.1	Disabled	-14.5		
Female	-21.7				

*Reference group represents 82,662 White non-disabled, male workers, in the private sector (non-STEM occupations), with a non-STEM Bachelor degree, 43.7 years average age (SD = 11.3) and worked on average 43.6 hours/week (SD = 8.9), 50 to 52 weeks in the prior year earning a median wage of \$73,130.

Wage Multipliers by Educational Level and STEM Degree Status White and Hispanics in Non-STEM and STEM Occupations

Education Level	Reference Group	Non-STEM Occupation		STEM Occupation	
		Non-STEM	STEM	Non-STEM	STEM
White Male, non-Disabled					
Bachelors ^a	1.000		1.125	1.283	1.443
Masters	1.135		1.278	1.456	1.639
Professional	1.289		1.451	1.654	1.861
Doctorate	1.464		1.647	1.878	2.113
Hispanic Male, non-Disabled ^b					
Bachelors ^a	1.000	0.942	1.060	1.208	1.359
Masters	1.135	1.069	1.203	1.372	1.543
Professional	1.289	1.214	1.366	1.557	1.752
Doctorate	1.464	1.379	1.551	1.768	1.990

^aReference group shown represents 82,662 White male non-disabled workers, in the private sector (non-STEM occupations), with a non-STEM Bachelor degree, 43.7 years average age (SD = 11.3) and worked on average 43.6 hours/week (SD = 8.9), 50 to 52 weeks in the prior year earning a median wage of \$73,130.

^bHispanic male, non-disabled workers with similar work hours/week and weeks/year.

Findings:

- Wages determined by whether the worker has a STEM degree and working in non-STEM or STEM occupation.
- Wage disparities exist between White and Hispanic males by education level.

STEM Degreed Working in a STEM Occupation

STEM Degree Equivalents		
Hispanic*	Wage Value	White*
Bachelors 1.359	<	Bachelors 1.443
Masters 1.543	≈	Bachelors 1.443
Professional 1.752	≈	Masters 1.639
Doctorate 1.990	≈	Professional 1.861

*Male, non-disabled.

Those with least malleable characteristics, like Hispanic male, require one education level higher than White males to achieve wage parity or competitiveness.

STEM Degreed Workers Non-STEM:STEM Occupation Ratio by Ethnicity

Ethnicity	STEM Degreed	Occupation		NS:STEM Ratio	
		Non-STEM (NS) Count	%Teachers		STEM Count
White	66,805	42,359	17.0	24,446	1.73:1
Hispanic	5,809	3,958	18.7	1,851	2.14:1
Black	4,975	3,557	19.3	1,418	2.51:1
Asian	8,714	4,049	11.6	4,665	0.87:1
Other	408	300	14.7	108	2.78:1

There are losses of STEM degreed workers to non-STEM occupations, more so for Blacks and Hispanics, followed by White workers. Overall, for every 1 STEM-degreed worker in a STEM occupation, 2.1 STEM-degreed workers are employed in a non-STEM occupation.

STEM Degreed Workers Non-STEM:STEM Occupation Ratio by Education Level

Education Level	STEM Degreed				
	Non-STEM to STEM Occupation Ratio				
	White	Hispanic	Black	Asian	Other
Bachelors	1.82:1	2.35:1	2.61:1	1.09:1	2.98:1
Masters	2.05:1	2.45:1	3.28:1	0.93:1	3.38:1
Professional	1.10:1	1.10:1	1.27:1	0.37:1	0.86:1
Doctorate	1.19:1	1.39:1	1.32:1	0.65:1	2.33:1

Most of the losses of STEM degreed workers to non-STEM occupations takes place at the Bachelors and Masters education levels, more so for Blacks and Hispanics, followed by White workers.

Implications for MSIs (HBCUs, HSIs, TCUs)

What interventions can MSIs do to address these issues:

- Continue to deliver “Human Capital” development to ensure STEM competency
- Significantly increase STEM students’
 - Social Capital (e.g., job networking and interview abilities, advocacy and negotiating skills), which is needed to manage a successful career
 - English language skills (speaking, writing, reading, and listening), which are essential to high performance in the STEM workplace
 - Purposeful Life Planning tools to create work-life balanced STEM workers

QUESTIONS?





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