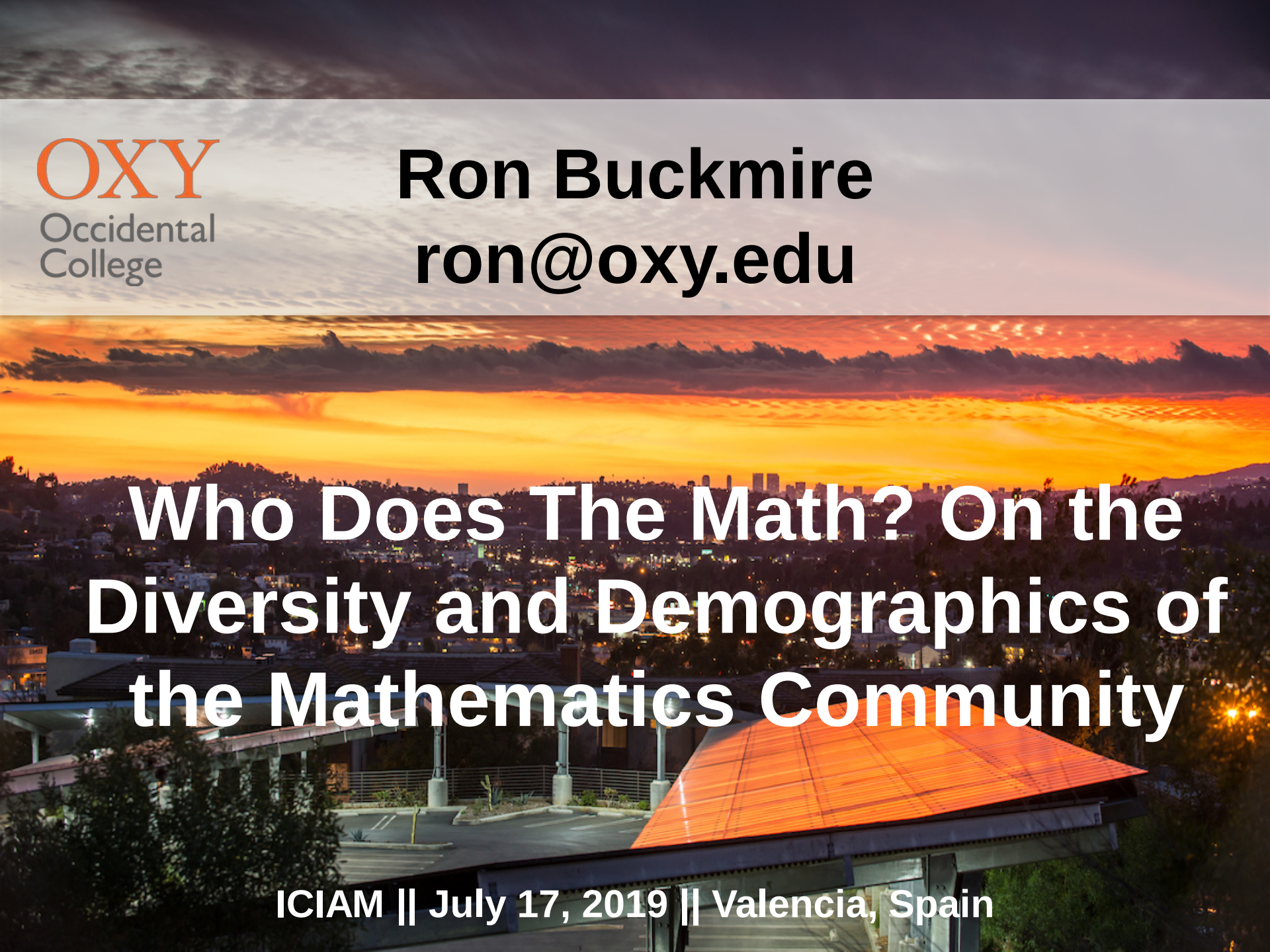

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Who Does The Math? On the Diversity and Demographics of the Mathematics Community

ICIAM || July 17, 2019 || Valencia, Spain

Goals of this Talk

- **Pose some questions about how “We” define the “Mathematics Community”**
- **Advocate for the idea that mathematics is a human endeavor**
- **Provide demographic details about the “United States Mathematics Community” which demonstrate the underrepresentation of certain groups**
- **Discuss some implications of this underrepresentation**

What Is The “Mathematics Community”?

The Mathematics Community: Some Definitions

1. The set of individuals who are defined to be mathematicians.
2. The set of individuals who identify themselves as members of the mathematics community.
3. The set of individuals who belong to one or more professional mathematics organizations.
4. The set of individuals who teach, study, research, do, learn, or are interested in, mathematics.

Def. 3: Membership in Mathematical Organizations

Membership Demographics of SIAM

All Membership (Non-Student)	Number	Percentage
Male	6446	78.70
Female	1171	14.30
Unanswered	569	6.95

Regular Membership (U.S. Only)	Number	Percentage
Male	6432	69.95
Female	1788	19.45
Unanswered	961	10.45

Regular Membership (Non U.S.)	Number	Percentage
Male	3580	74.37
Female	685	14.23
Unanswered	544	11.30

Source: Society for Industrial and Applied Mathematics, 2019.

What Does *A* (U.S.) Mathematician *Look* Like?

Source: Williams, George-Jones & Hebl (2018)

(Some) Demographics of the United States

Race and Ethnicity in the U.S.

Categories (Race and Ethnicity)	Percentage
White	**75.7**
Black or African-American	**13.9**
American Indian and Alaska Native	**1.7**
Asian	**6.3**
Native Hawaiian and Other Pacific Islander	**0.4**
Hispanic or Latino (any race)	**17.6**
Some other race	**5.4**

Source: U.S. Census Bureau

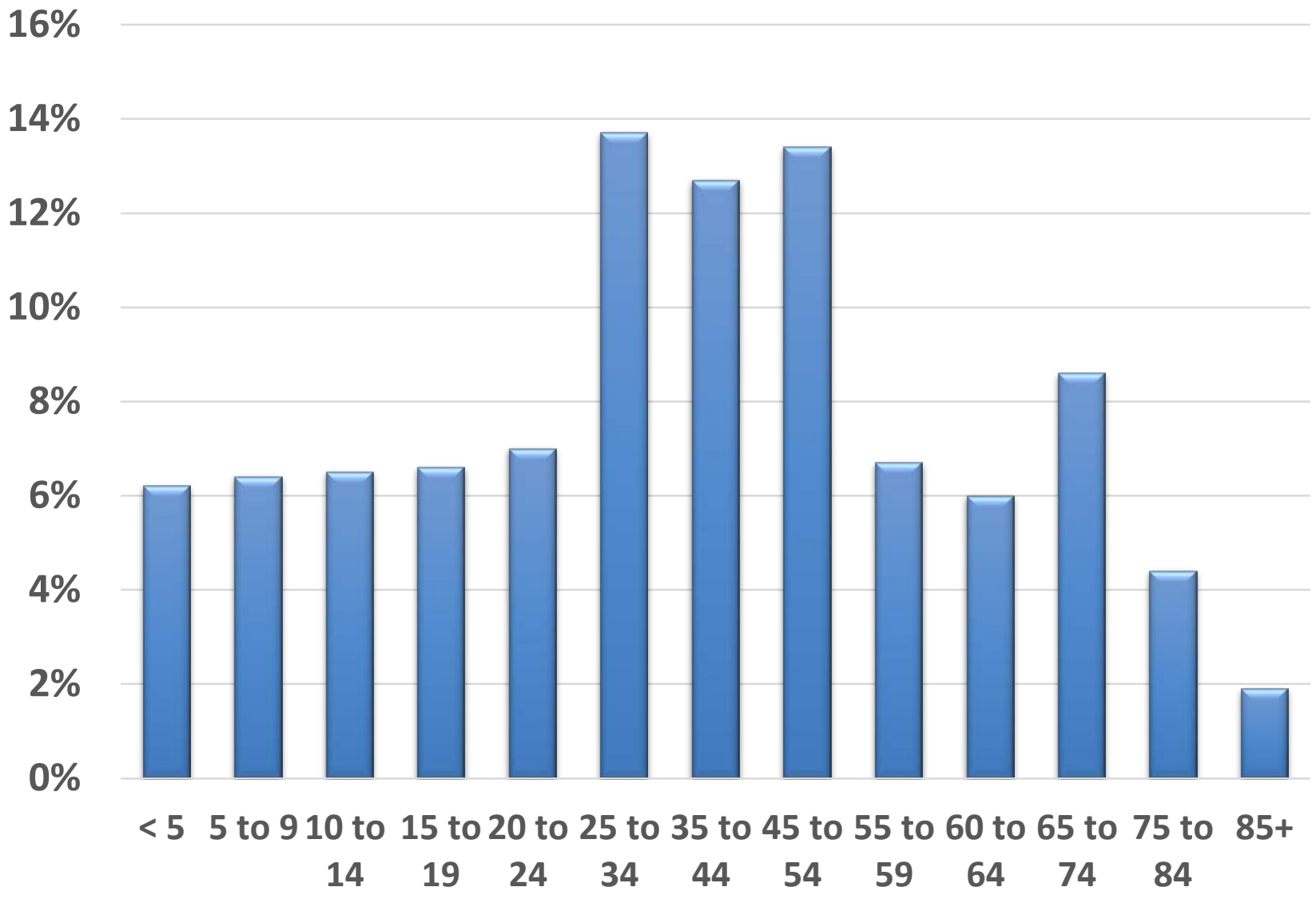
Gender in the U.S.

Categories (Total Population)	Percentage
Male	**49.2**
Female	**50.8**

Categories (Voting Population)	Percentage
Male	**48.4**
Female	**51.6**

Source: U.S. Census Bureau

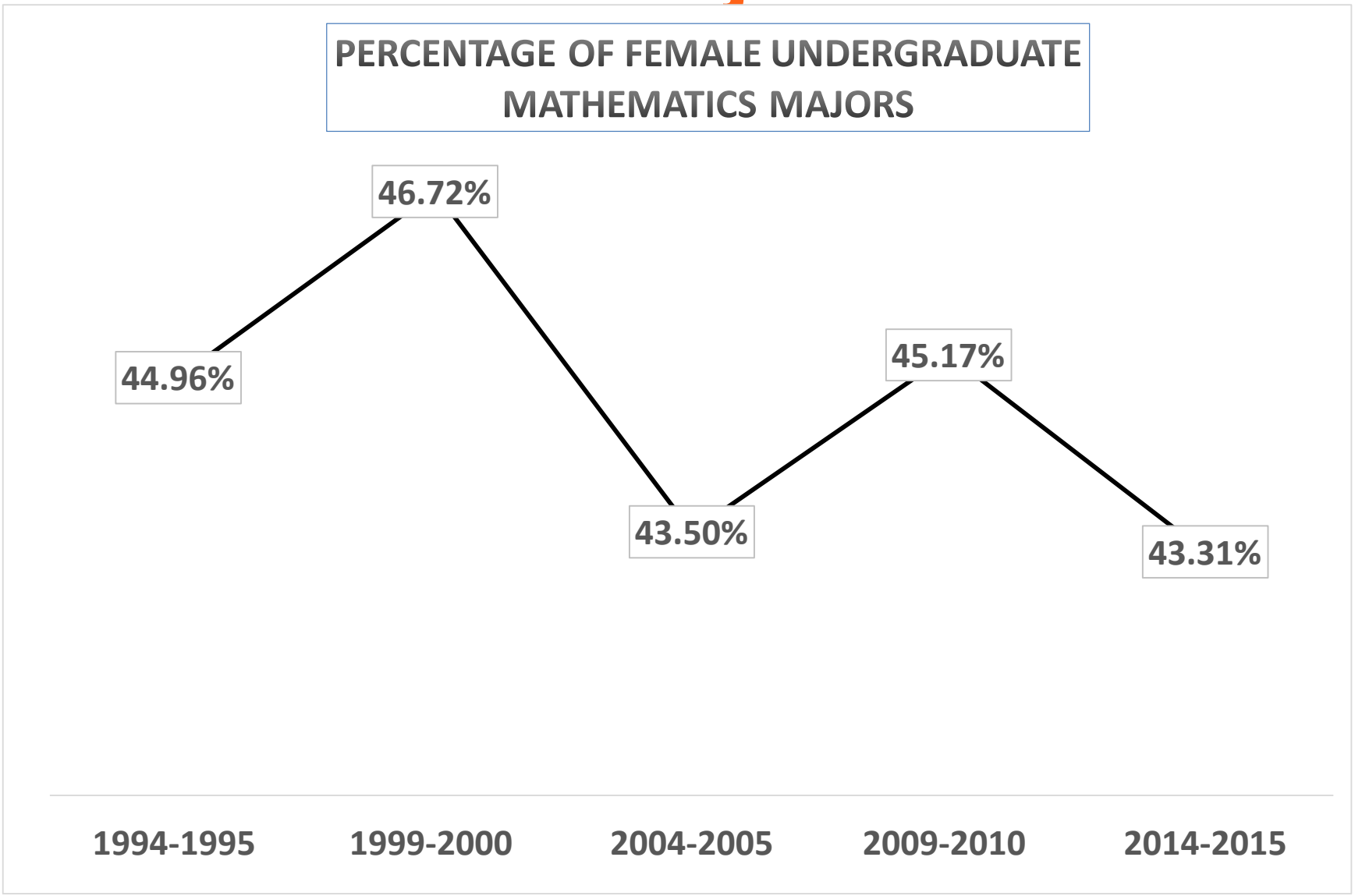
Age Distribution in the U.S.



Source: U.S. Census Bureau

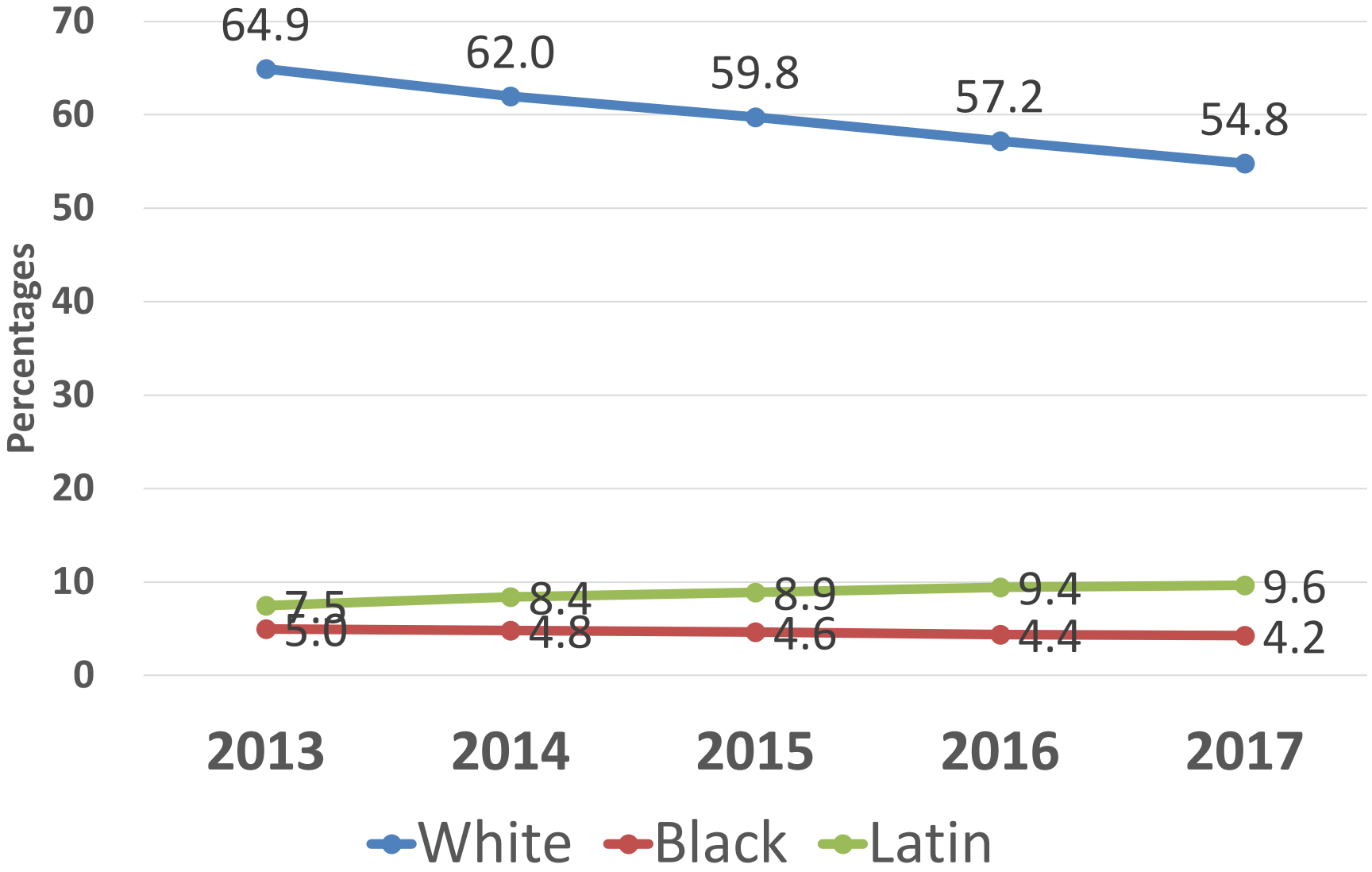
(Some) Demographics of the Mathematics Community

Mathematics Majors: Gender



Source: Fall 2015 CBMS Survey

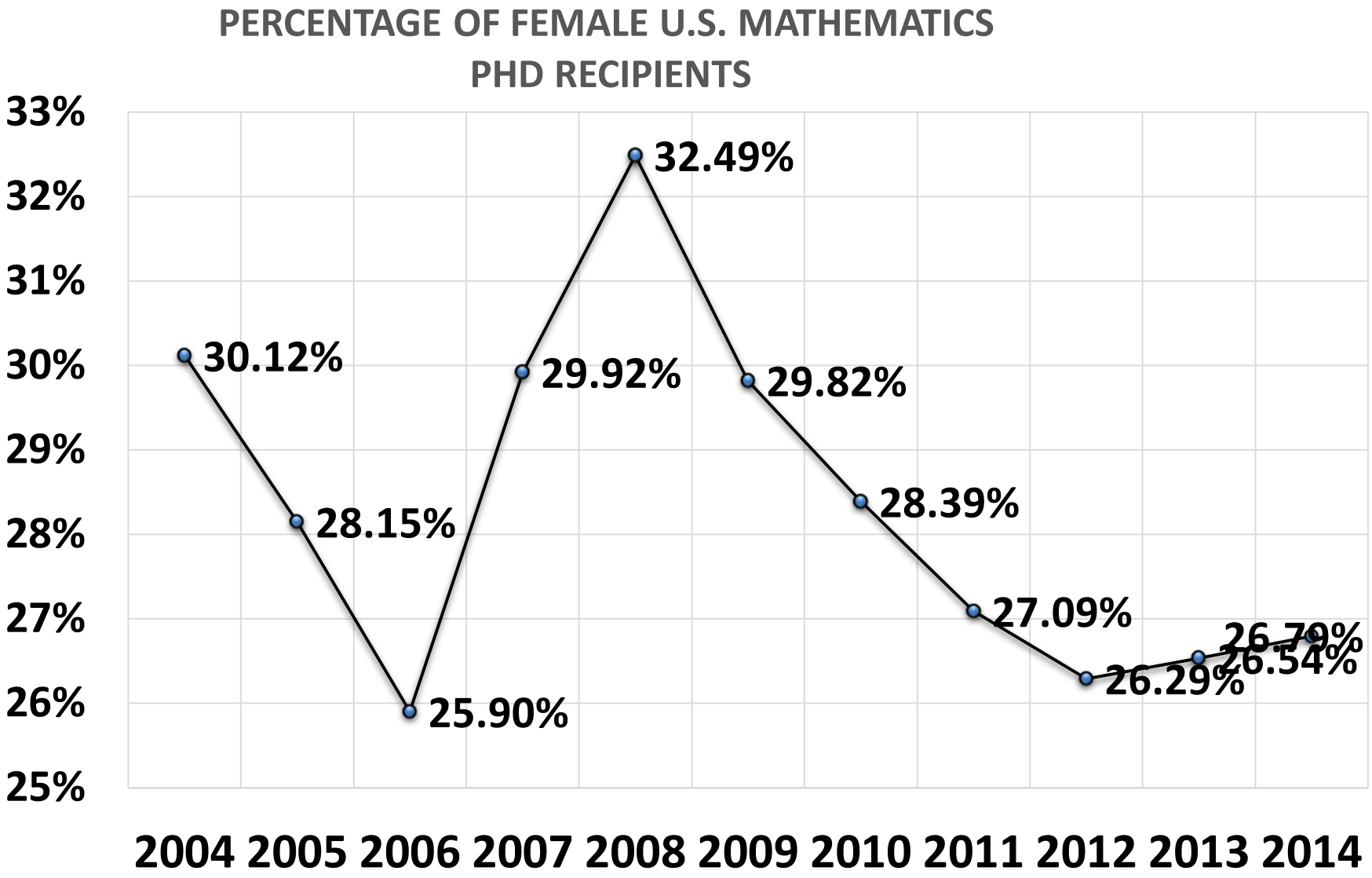
Mathematics* Degrees: Race & Ethnicity



*Mathematics and Statistics degrees

Source: U.S. Department of Education, National Center for Education Statistics, 2018

Mathematics Ph.D. Recipients: Gender



Source: Nicole Joseph, Vanderbilt University

U.S. Mathematics Ph.D. Recipients: Race and Ethnicity (Women only)

	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Black	1	9	5	5	11	16	9	9	10	6	9
Hispanic or Latinx	5	6	11	4	5	12	8	9	11	6	7
Asian or Pacific Islander	14	26	20	29	24	27	39	38	22	34	32
Native American	0	0	0	1	0	1	0	0	0	1	1
White	118	101	102	132	161	154	168	155	163	170	179
Other	15	10	13	22	17	25	21	18	15	22	22

Source: Nicole Joseph, Vanderbilt University

Mathematics Faculty Demographics: Age (Universities)

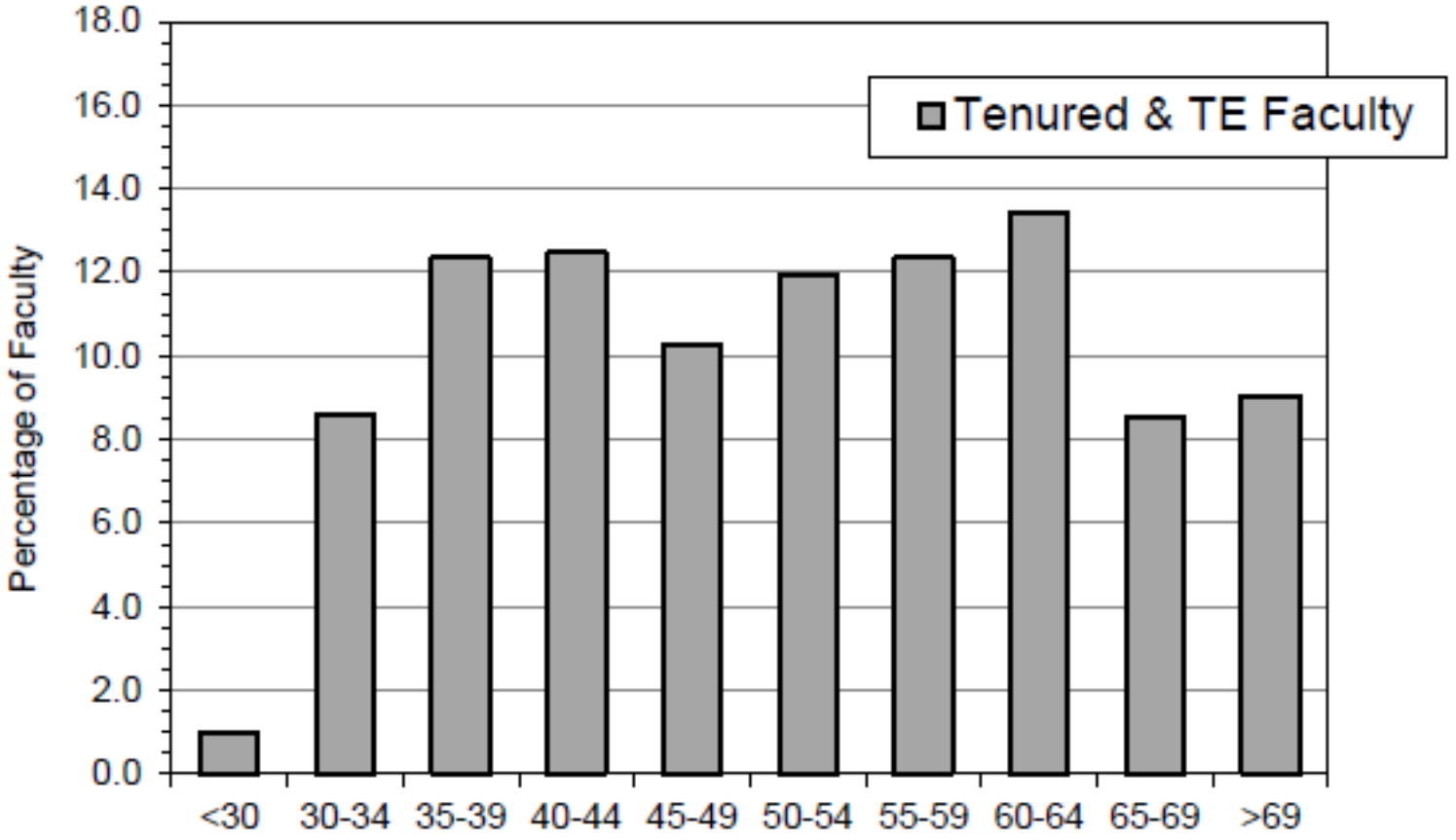


FIGURE F.4.1 Percentage of tenured and tenure-eligible faculty in doctoral mathematics departments in various age groups in fall 2015.

Source: Fall 2015 CBMS Survey

Mathematics Faculty Demographics: Age (4-year colleges)

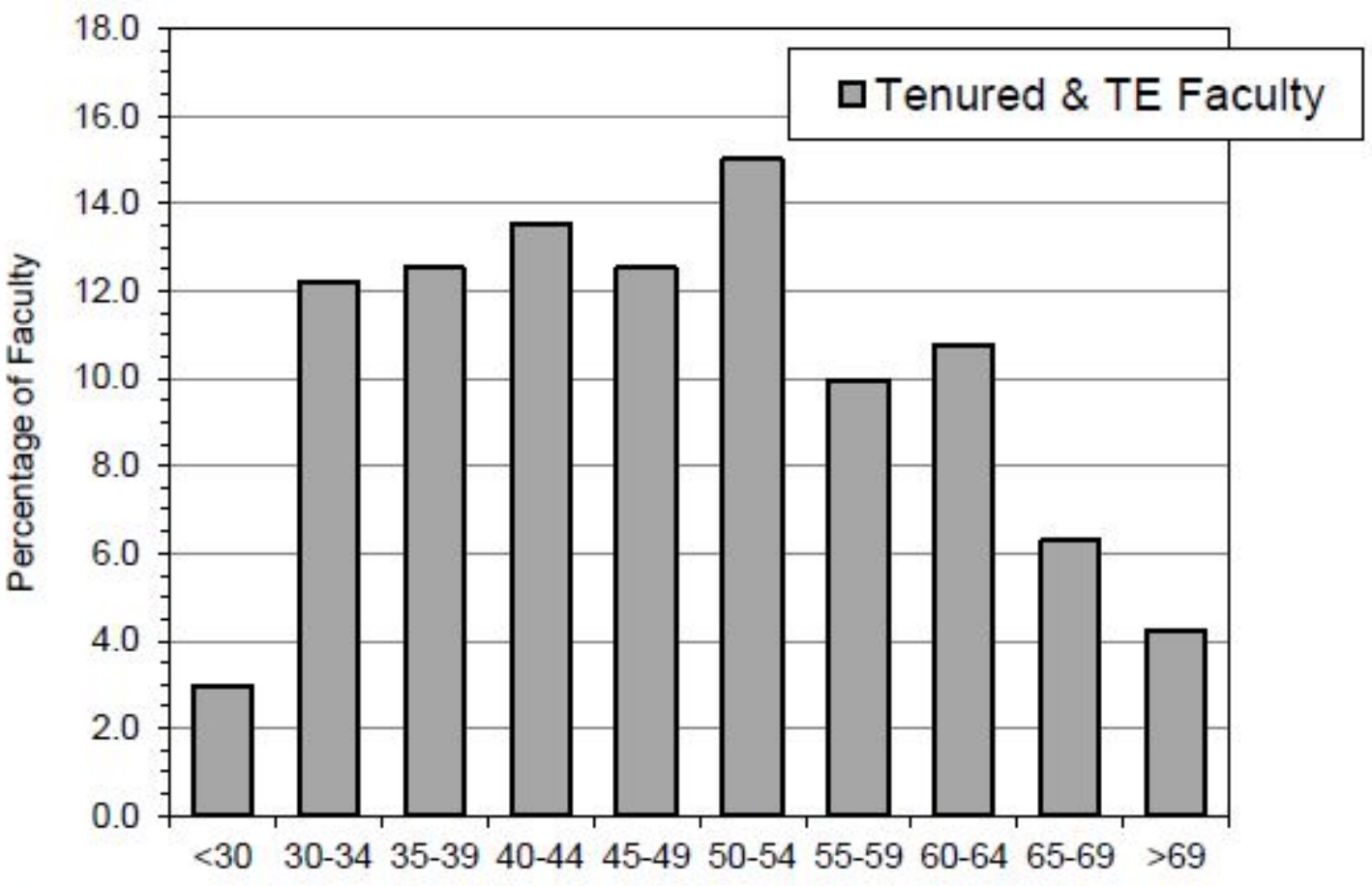


FIGURE F.4.3 Percentage of tenured and tenure-eligible faculty in bachelors-level mathematics departments belonging to various age groups in fall 2015.

Source: Fall 2015 CBMS Survey

Mathematics Faculty Demographics: Race, Ethnicity & Gender by Department Type

	Percentage of Full-time Faculty					
	Asian %	Black, not Hispanic %	Mexican American/ Puerto Rican/ other Hispanic %	White, not Hispanic %	AIAN or NHPI [1] %	Unknown %
PhD Mathematics Departments						
All full-time men	15	1	3	55	0	2
All full-time women	5	0	1	16	0	1
MA Mathematics Departments						
All full-time men	11	2	3	46	0	2
All full-time women	6	1	1	26	0	1
BA Mathematics Departments						
All full-time men	6	2	1	53	0	2
All full-time women	4	1	1	30	0	1
All Statistics Departments						
All full-time men	22	1	2	45	0	2
All full-time women	11	0	1	15	0	1

TABLE F.5 Percentages of full-time faculty belonging to various ethnic groups, by gender and type of department, in fall 2015. Except for round-off, the percentages within each departmental type sum to 100%.

Source: Fall 2015 CBMS Survey

Mathematics Faculty Demographics: Race, Ethnicity & Gender by Tenure Status

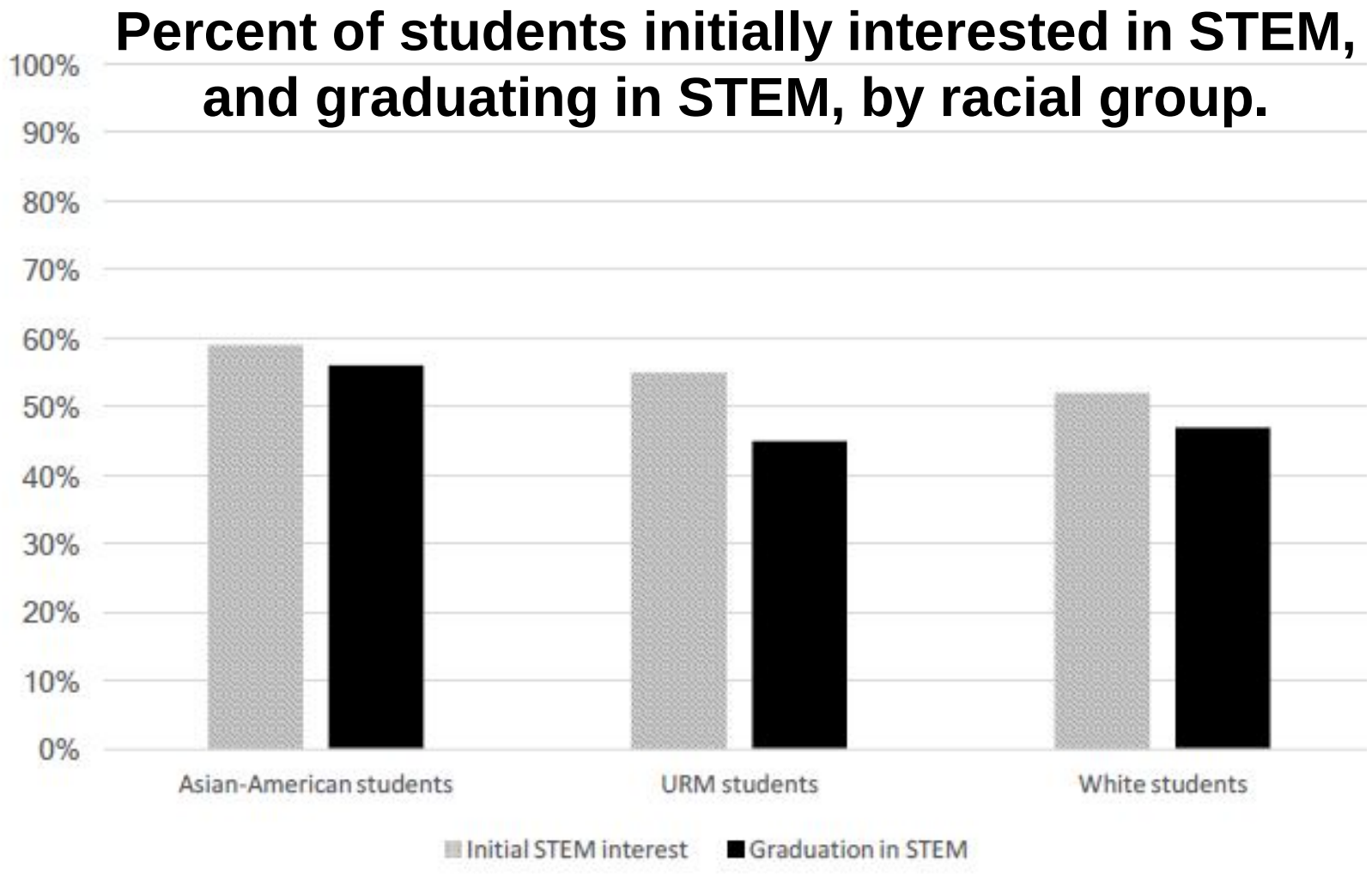
Mathematics Departments	Asian %	Black, not Hispanic %	Mexican American/ Puerto Rican/ other Hispanic %	White, not Hispanic %	AIAN & NHPI [1] %	Unknown %
Tenured Men	6	1	1	32	0	1
Tenured Women	2	0	0	9	0	0
Tenure-eligible men	2	0	0	7	0	0
Tenure-eligible women	1	0	0	4	0	0
Postdoctoral men	1	0	0	3	0	0
Postdoctoral women	0	0	0	1	0	0
Full-time men not included above	1	0	1	11	0	1
Full-time women not included above	1	0	0	10	0	0
Total full-time men	11	2	2	53	0	2
Total full-time women	4	1	1	24	0	1

TABLE S.18 Percentage of gender and of racial/ethnic groups among all tenured, tenure-eligible, postdoctoral, and other full-time faculty in mathematics departments of four-year colleges and universities in fall 2015. This table can be compared to CBMS2010 Table S.19, p. 44.

Source: Fall 2015 CBMS Survey

(Some) Implications of Underpresentation in STEM

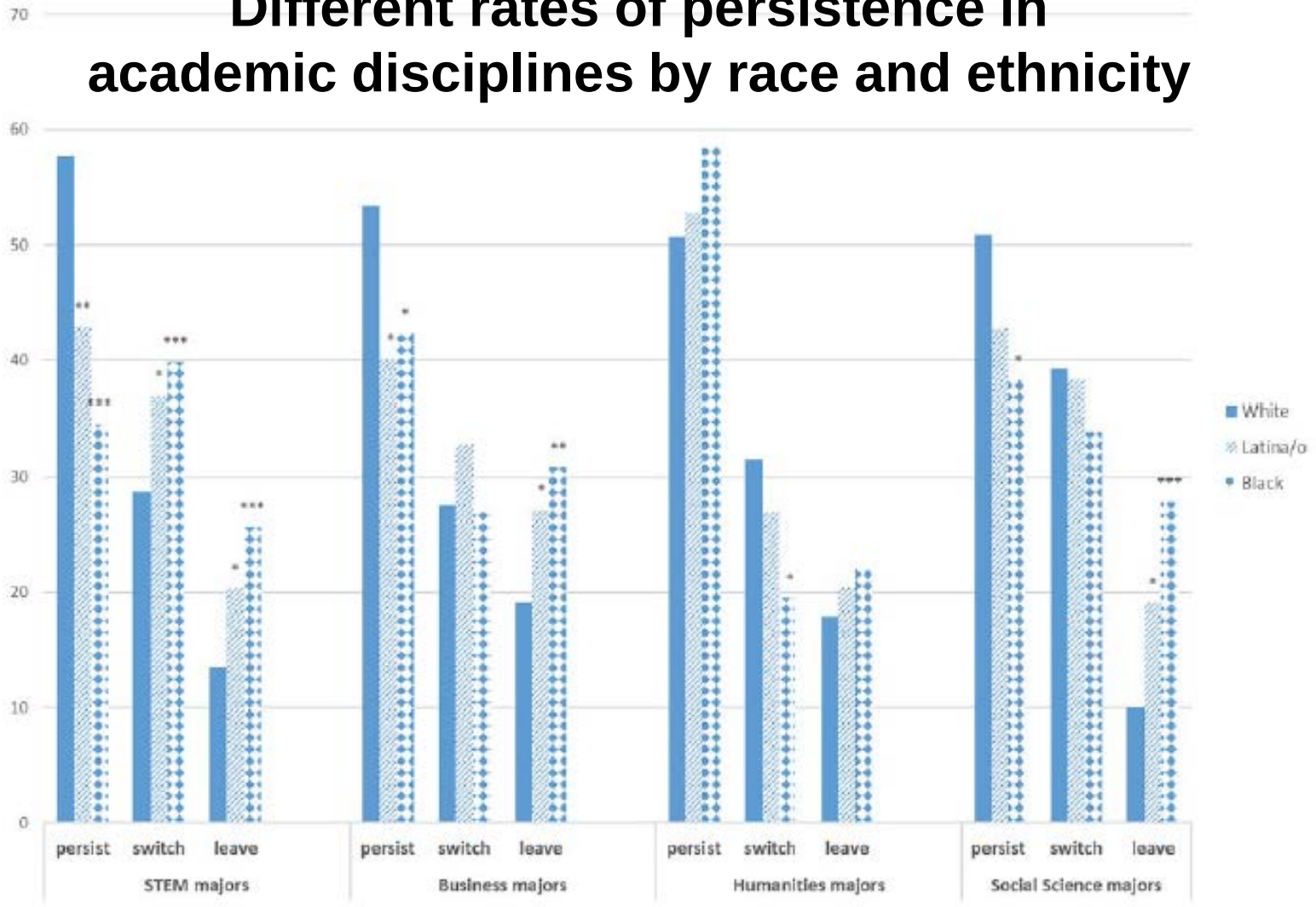
Implications of Underrepresentation in STEM



Source: Williams, George-Jones & Hebl, 2018

Implications of Underrepresentation in STEM

Different rates of persistence in academic disciplines by race and ethnicity



Source: Riegle-Crumb, King, & Irizarry, 2019,

Which one is “smart”?

Choose one:

smart

Source: Williams, George-Jones & Hebl, 2018

Which one is “smart”?

Choose one:

smart

Source: Williams, George-Jones & Hebl, 2018

Phenotypic Stereotypicality and STEM Persistence (Williams *et al*, 2018)

- Different racial groups have different rates of STEM persistence
- Racial phenotypic stereotypicality is a factor in STEM persistence.
- Racial phenotypic stereotypicality negatively relates to STEM persistence among college students from under-represented minority groups.
- Gender was a more salient factor in African-Americans than among Asian-Americans or White participants

Summary

Summary

- “Who does the math” is important
- Underrepresentation of certain groups (by race and gender) in the mathematics community is significant and persistent
- Underrepresentation combines with stereotyping to produce negative impacts on certain groups
- Knowledge and vigilance can attempt to ameliorate these impacts

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Thank you.

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