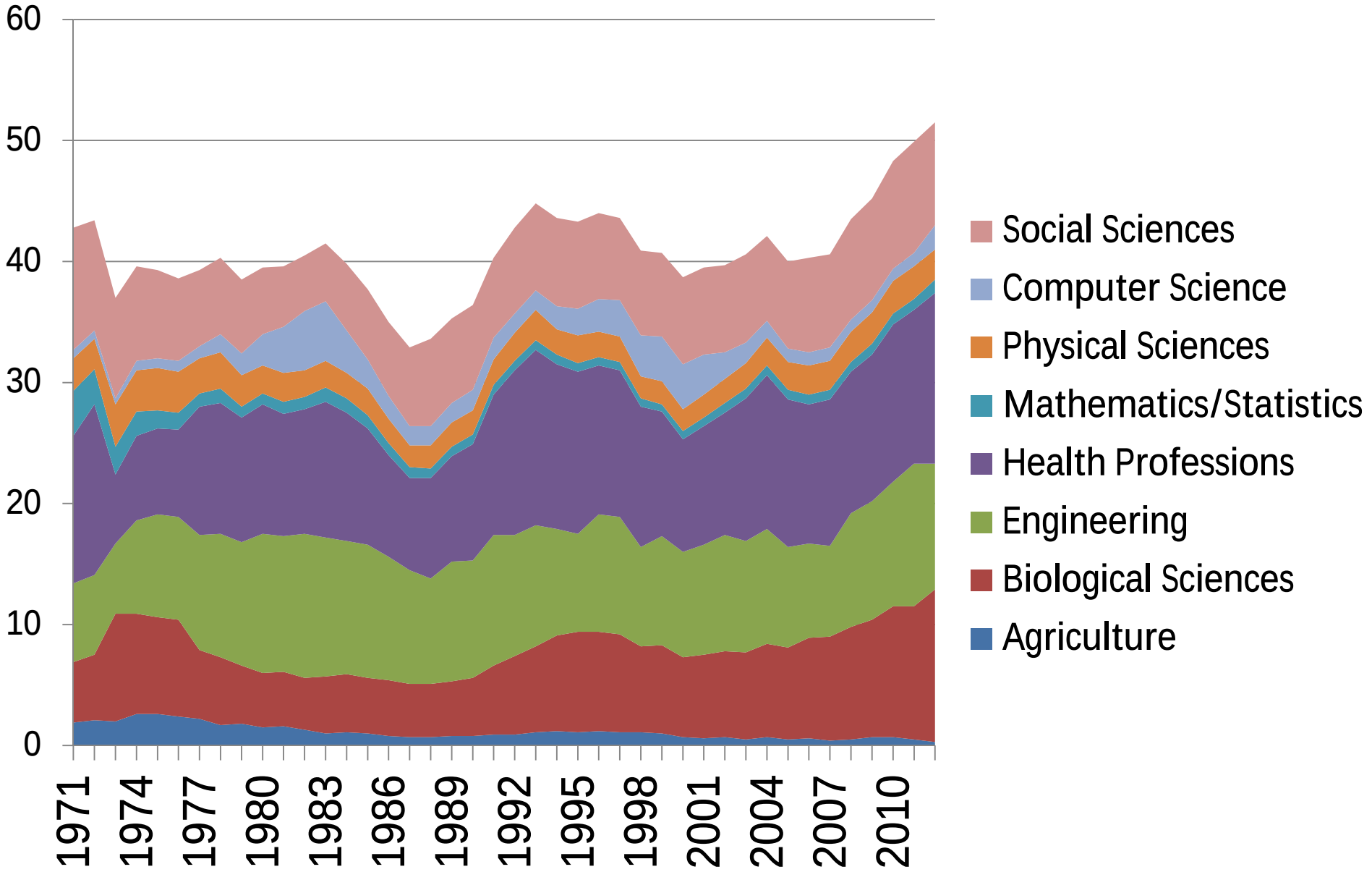
STEM Pathways among Students Who Start at Four-Year Colleges and Universities

January 22, 2014

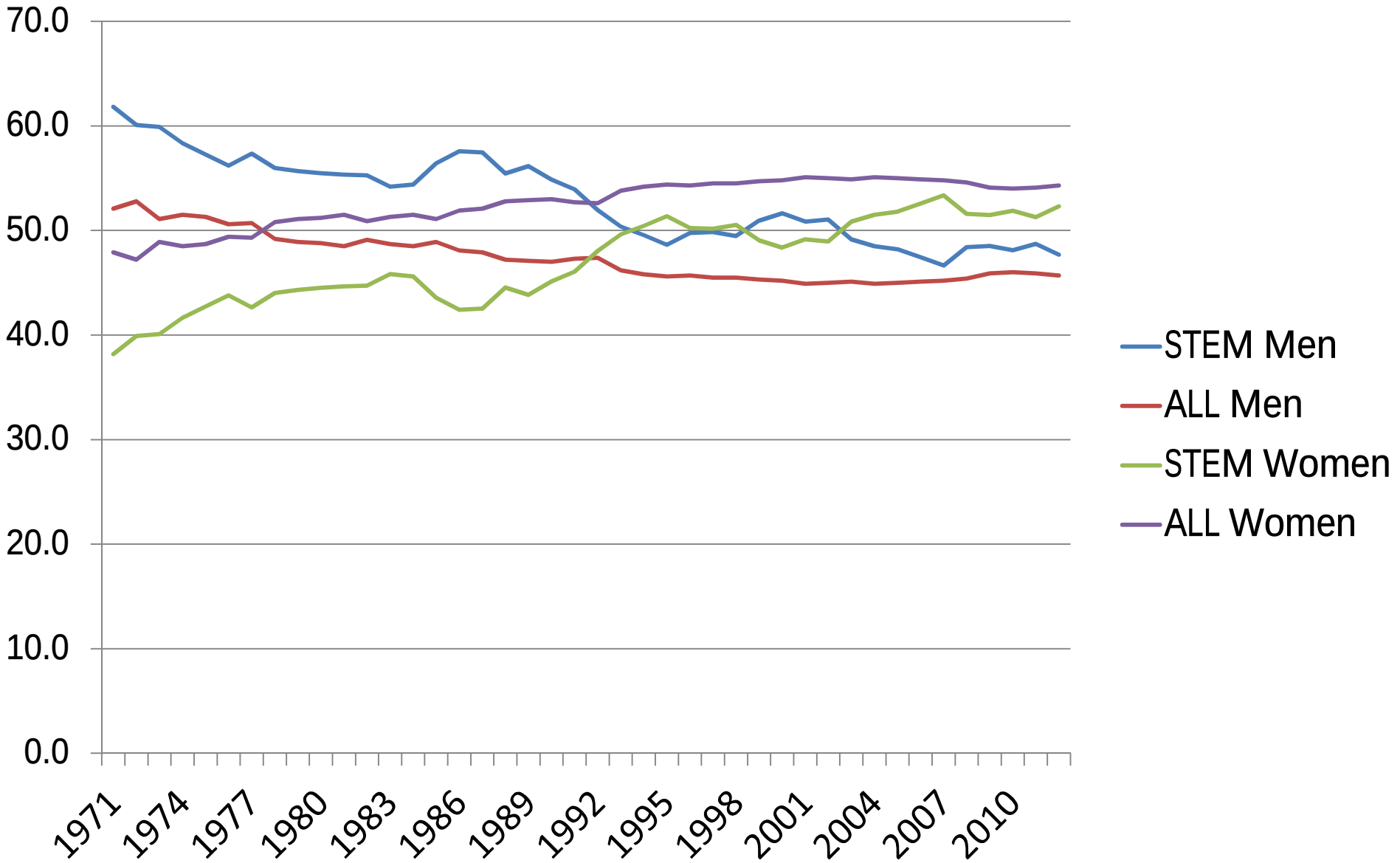
Workshop on Barriers and Opportunities in Completing 2- and 4-Year STEM Degrees

Kevin Eagan, Ph.D.

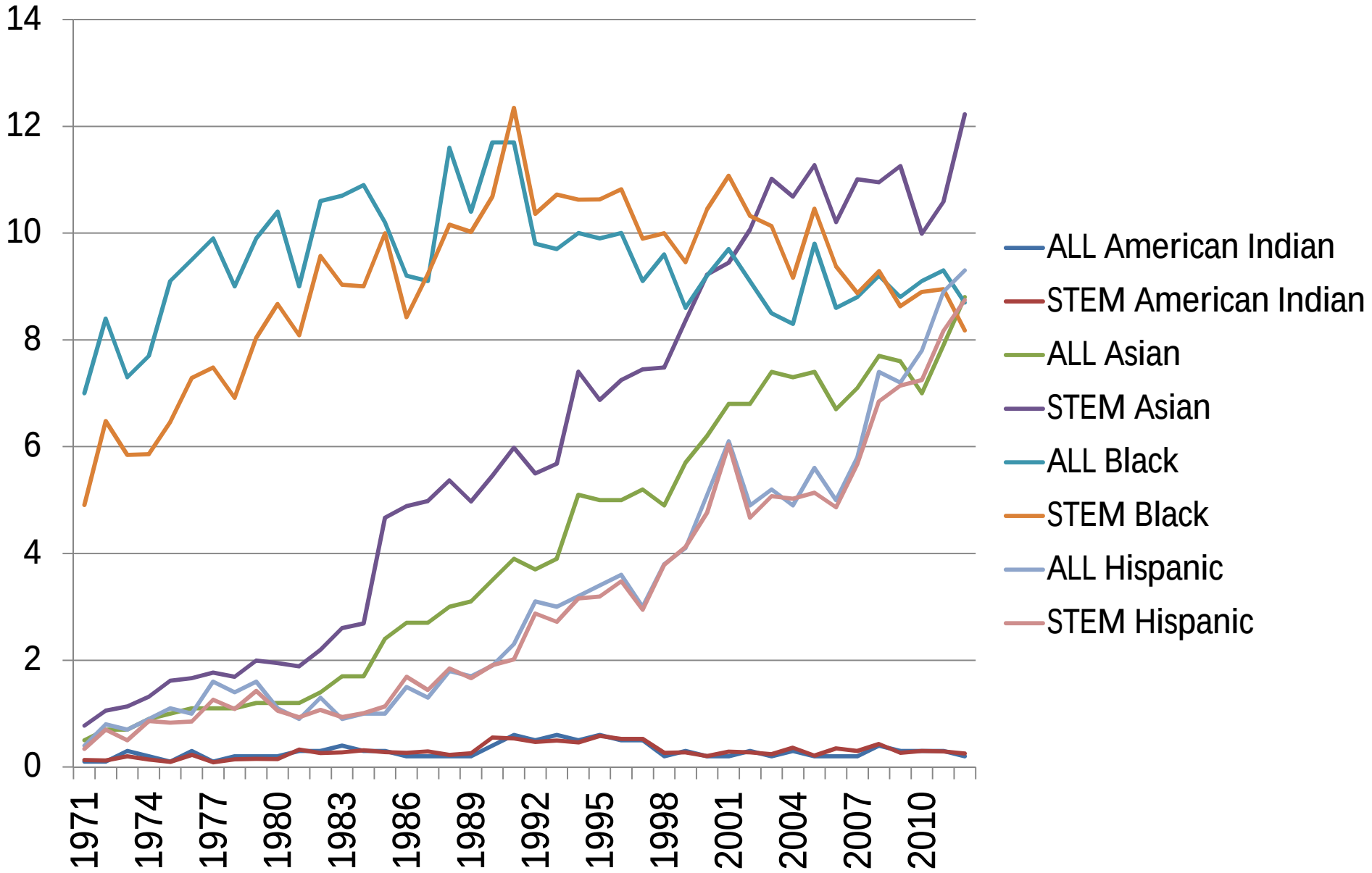
Academic Major Intentions among FTFT Undergraduates, 1971-2012



Gender Composition of STEM Aspirants vs. All FTFT Undergraduates, 1971-2012



Racial/Ethnic Composition of STEM Aspirants vs. All FTFT Undergraduates, 1971-2012



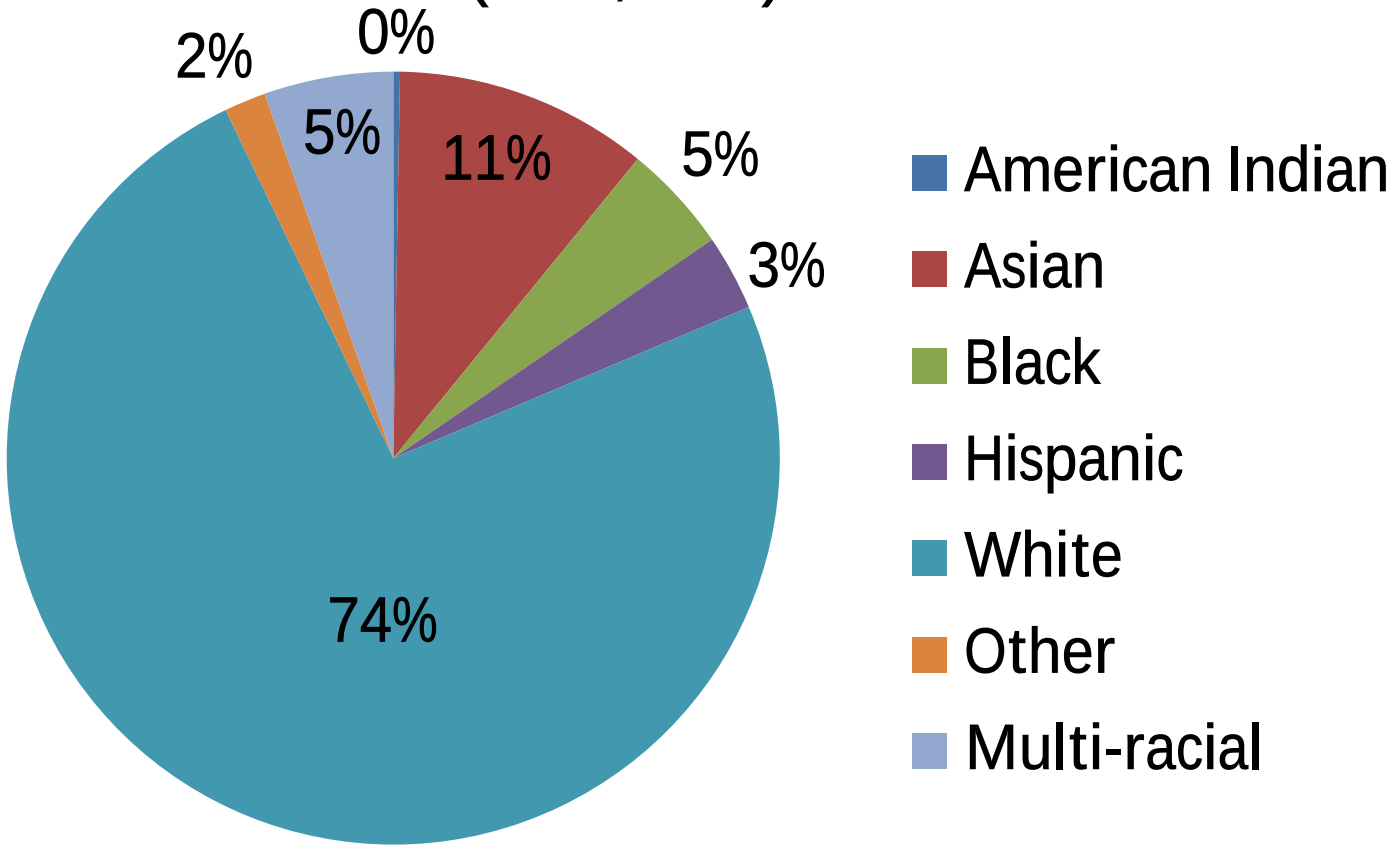
Comparing STEM Aspirants, SS-STEM Aspirants, and All FTFT Undergraduates in 2012

		STEM	SS-STEM	ALL
Sex				
	Men	47.7	45.0	45.7
	Women	52.3	55.0	54.3
Race				
	Black	8.2	8.6	8.7
	Latino	8.7	9.7	9.3
	Native American	0.3	0.2	0.2
	Asian	12.2	11.2	8.8
	White	59.3	58.6	61.3
Income				
	Below $50K	30.1	31.2	31.3
	$50K-$100K	32.2	31.4	31.2
	Above $100	37.7	37.4	37.6
Mother's Education				
	No College	23.7	24.3	24.3
	Some College	19.3	19.3	19.6
	College Degree or Higher	57.0	56.4	56.2

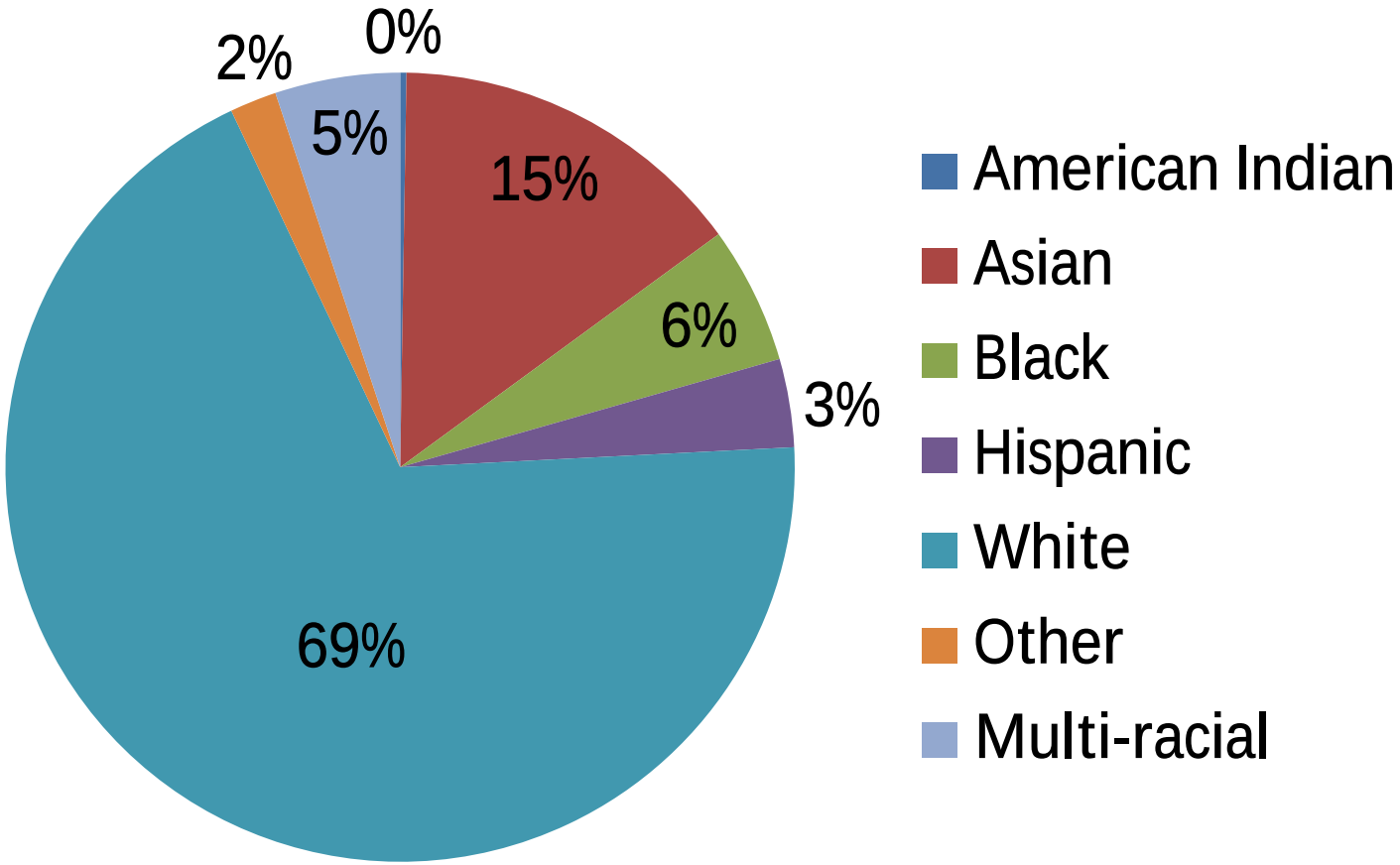
Demographics of Students who Switch into STEM and Complete in 6 years

(N=6, 110)

57% Female



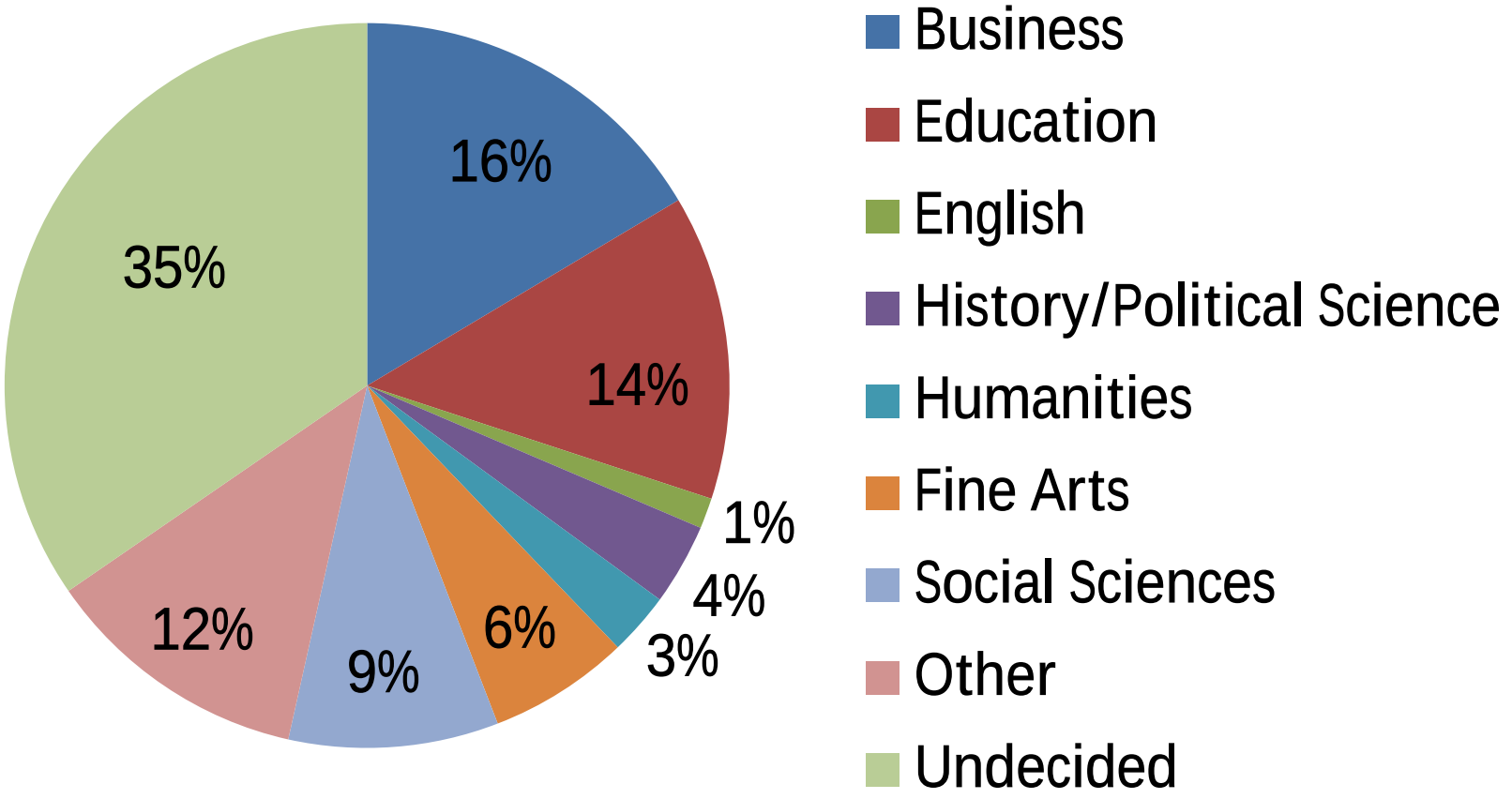
Demographics of Students who Start and Complete in STEM in 6 years



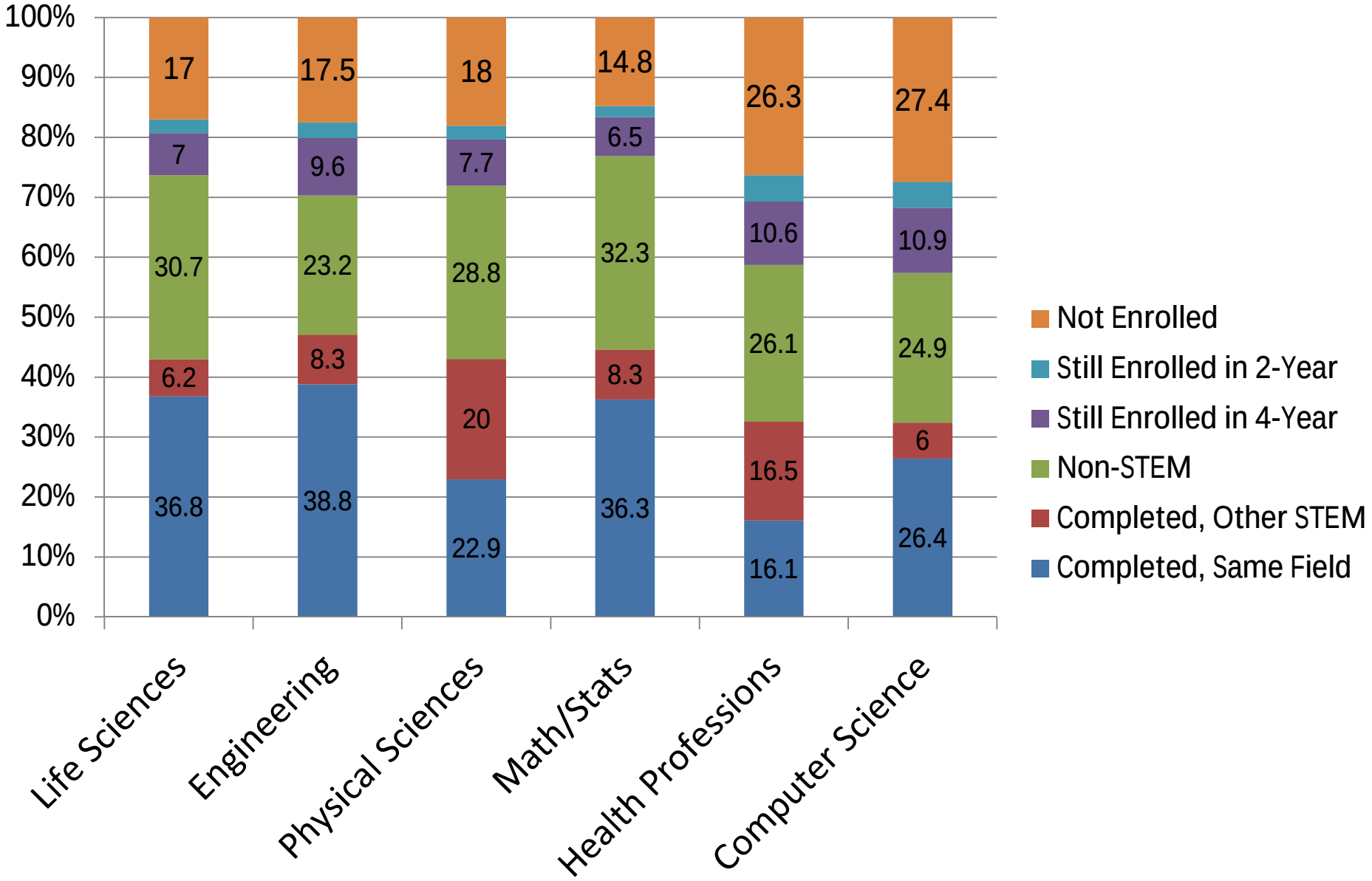
Characteristics of Students who Start and Complete in STEM in 6 years

Variable	
Parental Income	25.1% - Less than $49K 38.4% - Between 50K and 99K 36.5% - More than $100K
Parents' Education	62.9% - Fathers have college degree or higher 60.2% - Mothers have college degree or higher
Enrollment	99% - Full-time
Type of Institution	70.9% - Public 65.2% - Attend Universities & 34.8% Attend 4-year institutions 97.2% - White Institutions or HSIs

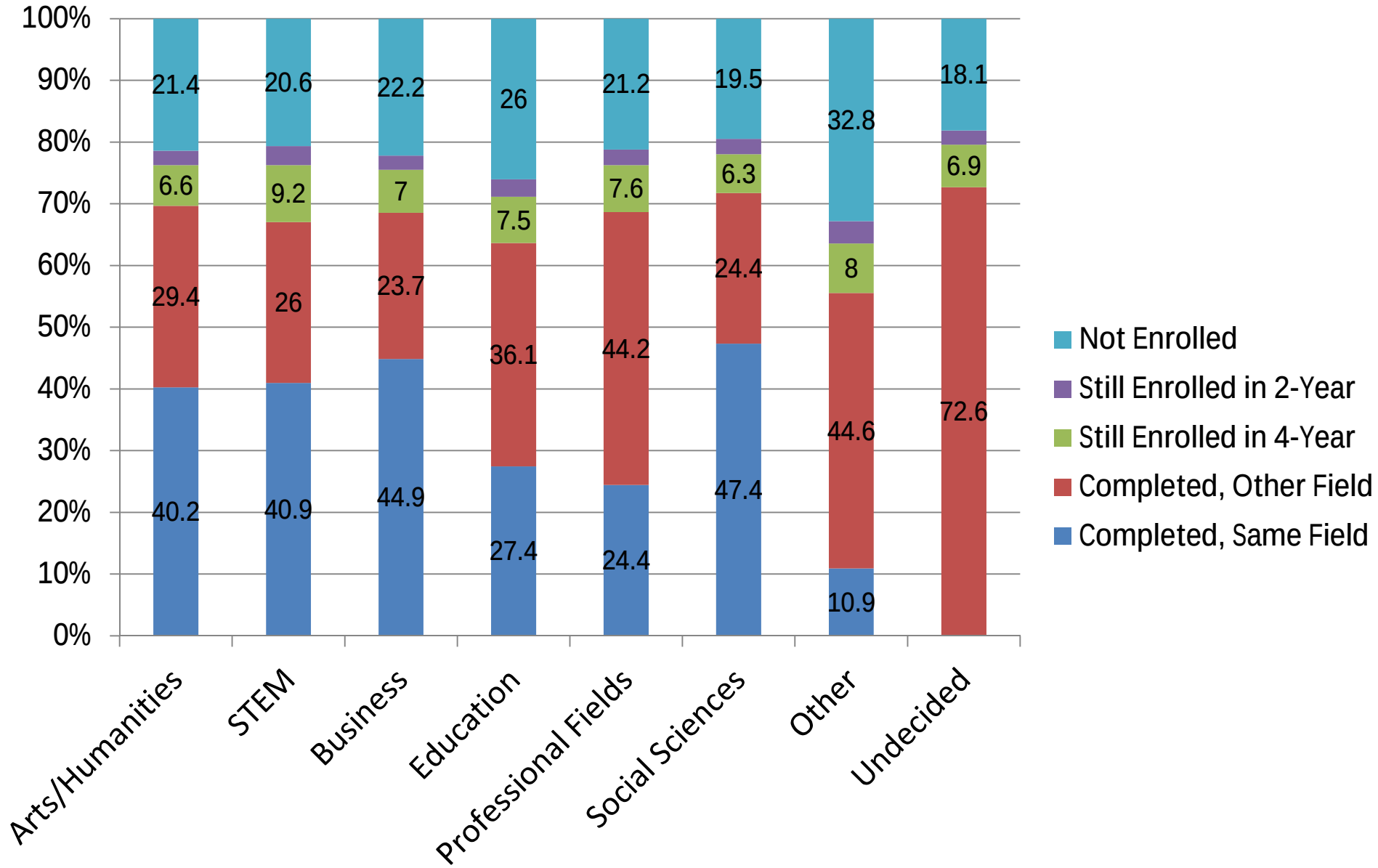
Majors STEM Switchers Initially Planned to Pursue



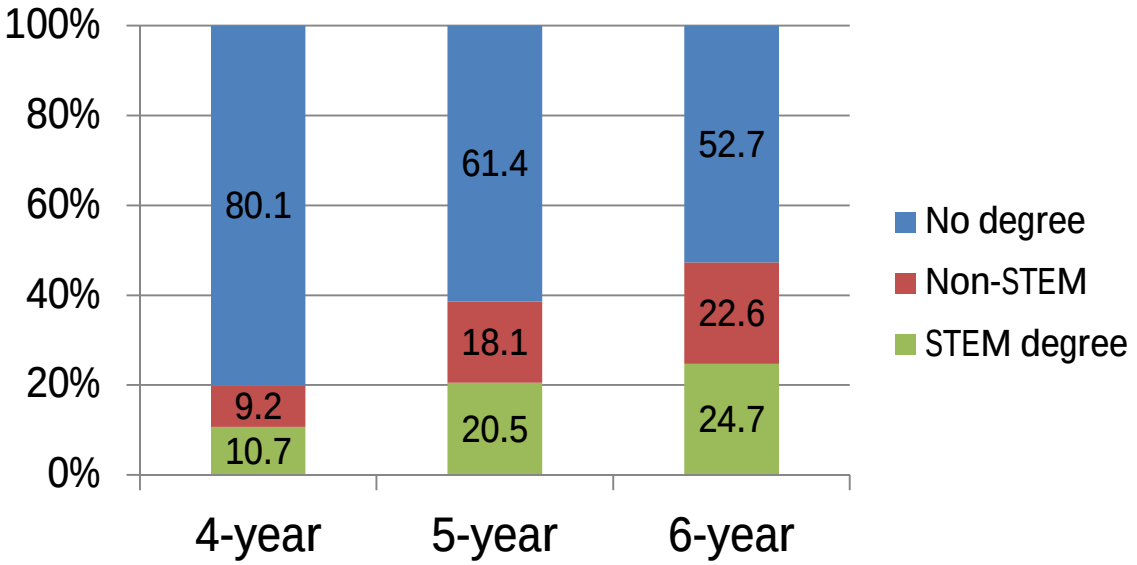
Enrollment/Completion Status of 2004 FTFT STEM Aspirants, by STEM Sub-Discipline



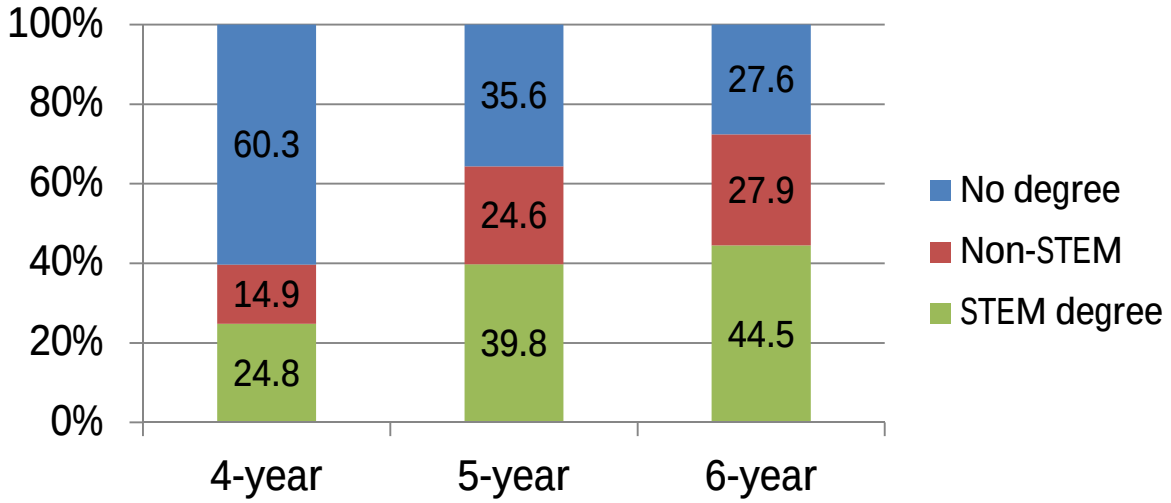
Enrollment/Completion Status of 2004 FTFT Undergraduates, by Aggregated Intended Major



Completion Rates of Underrepresented Minority STEM Aspirants



Completion Rates of White/Asian American STEM Aspirants



MSIs and STEM completion

- STEM aspirants who attend HBCUs and HSIs are no more likely to complete in STEM relative to both not completing and completing in a non-STEM field
  - For Black students, attending an HBCU increases their probability of completing a STEM degree relative to not completing
- STEM aspirants who attend emerging HSIs are more likely to complete a STEM degree relative to both not completing and completing in a non-STEM field

Delta-p statistics from STEM Completion model

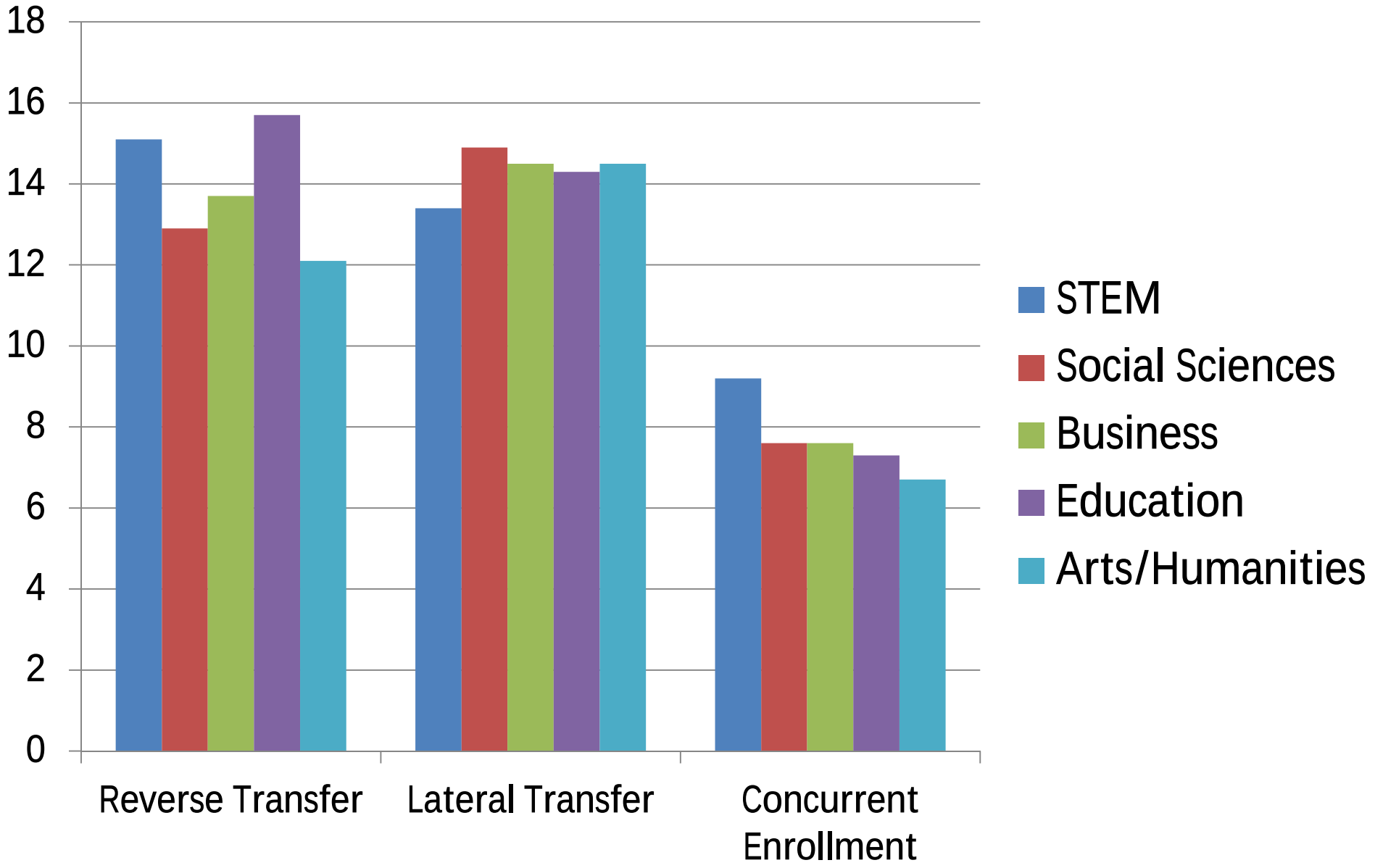
Institutional Summary

STEM completion relative to not completing			
	4-year	5-year	6-year
Control: Private	13.20%	n.s.	n.s.
Institutional type: Research (ref. masters comp.)	-8.90%	-11.44%	-10.60%
Percentage of undergraduates in STEM (10)	-0.22%	n.s.	n.s.
Undergraduate FTE enrollment (log)	4.09%	n.s.	5.25%
Percentage of STEM faculty involving undergraduates in research	9.11%	n.s.	9.50%
Selectivity (100)	10.83%	10.80%	7.41%
Emerging HSI	7.20%	16.20%	14.64%
Expenditures per FTE student	n.s.	0.25%	0.24%

STEM completion relative to non-STEM completion			
	4-year	5-year	6-year
Percentage of pre-med students (10)	-1.88%	-1.88%	2.30%
Undergraduate FTE enrollment (log)	-7.71%	-5.75%	-3.80%
Emerging HSI	7.76%	9.40%	8.40%

Delta-p statistics from STEM Completion model

Mobility Patterns of FTFT Undergraduates Entering College in 2004, by Major



Concluding Comments

- Interest in STEM fields continues to rise
- Diversity is present in initial interests
- Further breakdowns by field will be conducted to understand diversity
- Further work is needed to understand the role of institution and diverse students

Contact Info

Faculty/Co-PIs:
Sylvia Hurtado
Kevin Eagan

Graduate Research Assistants:
Tanya Figueroa
Bryce Hughes

Administrative Staff:
Dominique Harrison

Papers and reports are available for download from project website:

http://heri.ucla.edu/nih

Project e-mail: herinih@ucla.edu

This study was made possible by the support of the National Institute of General Medical Sciences, NIH Grant Numbers 1 R01 GMO71968-01 and R01 GMO71968-05, the National Science Foundation, NSF Grant Number 0757076, and the American Recovery and Reinvestment Act of 2009 through the National Institute of General Medical Sciences, NIH Grant 1RC1GM090776-01. This independent research and the views expressed here do not indicate endorsement by the sponsors.