

# Does Engagement Matter to Degree Completion? The Impact of Engagement on Community College Transfer Students' Success in STEM Fields of Study

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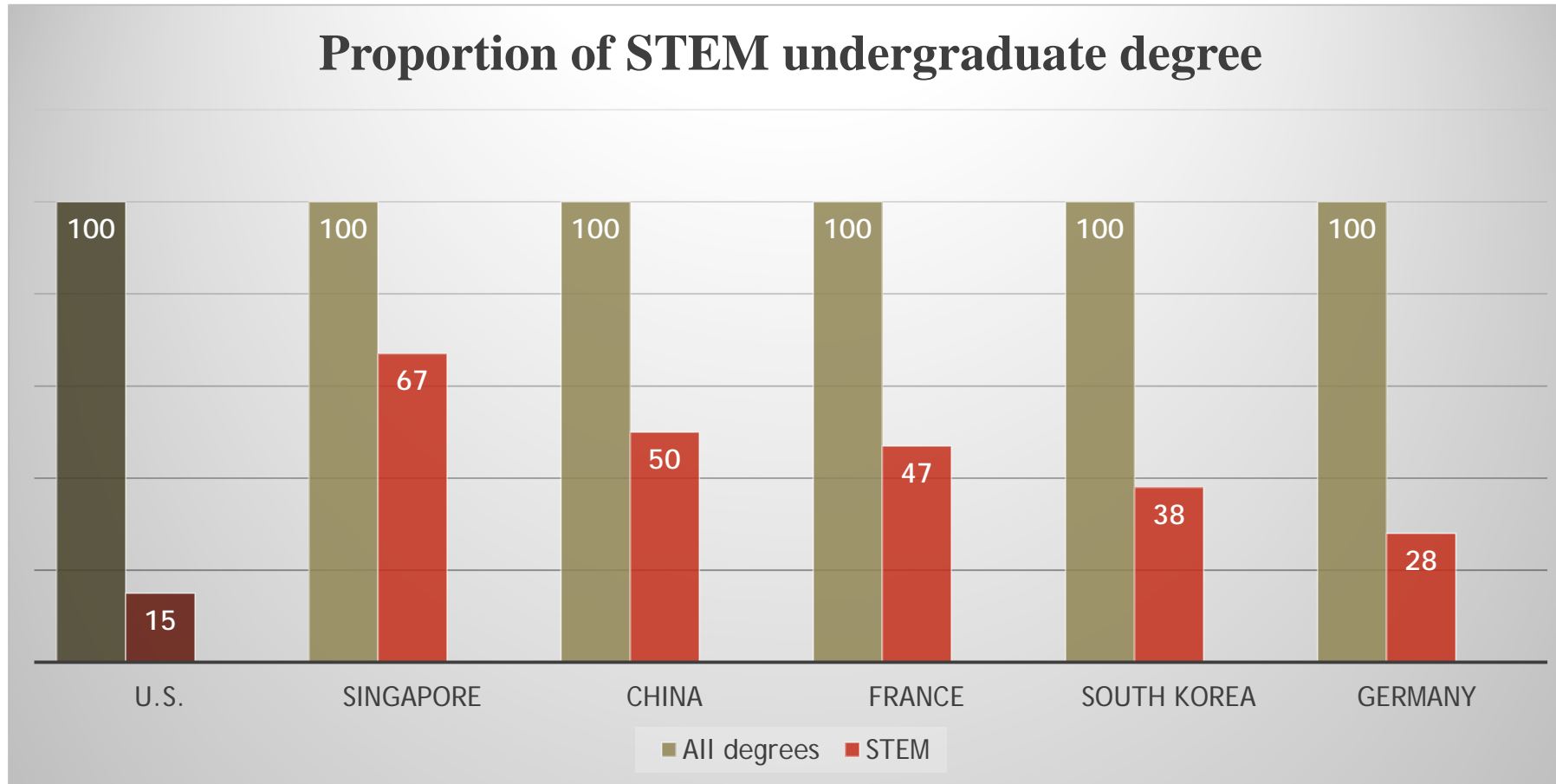
# OVERVIEW

- ▶ Rationale
- ▶ Purpose of the Study & Research Question
- ▶ Literature Review
- ▶ Theoretical Framework
- ▶ Data Analysis
- ▶ Findings
- ▶ Implications & Conclusion

# Rationale: The Importance of STEM Education

- ▶ STEM skills are pivotal to the U.S. way of life, national economic and security matters (National Science Foundation, 2010)
  - ▶ Demand for STEM profession is expected to exceed the workforce needs in all other occupation between 2012 and 2022 (Vilorio, 2014)
  - ▶ Many more STEM careers now require 4-year degree (Carnevale, Smith, & Strohl, 2010).
- ▶ The U.S. is falling behind other nations in the proportion of STEM degrees attained (Kuenzi, 2008).

# Rationale: STEM Degree Completion



Committee on Science, Engineering, and Public Policy, 2010

# Rationale: The Role of Community College

- ▶ The U.S. must retain students entering college every year and guide them to major in STEM field to regain leadership role in STEM education.
- ▶ A strategy to increase STEM graduates: focus on community college transfer students (Hagedorn & Purnamasari, 2012).
  - ▶ About half of all college students in the United States who pursue STEM fields begin their studies at a community college (Starobin & Laanan, 2010)
- ▶ Problem: little data and empirical findings have been offered regarding STEM degree attainment among CC transfer students.

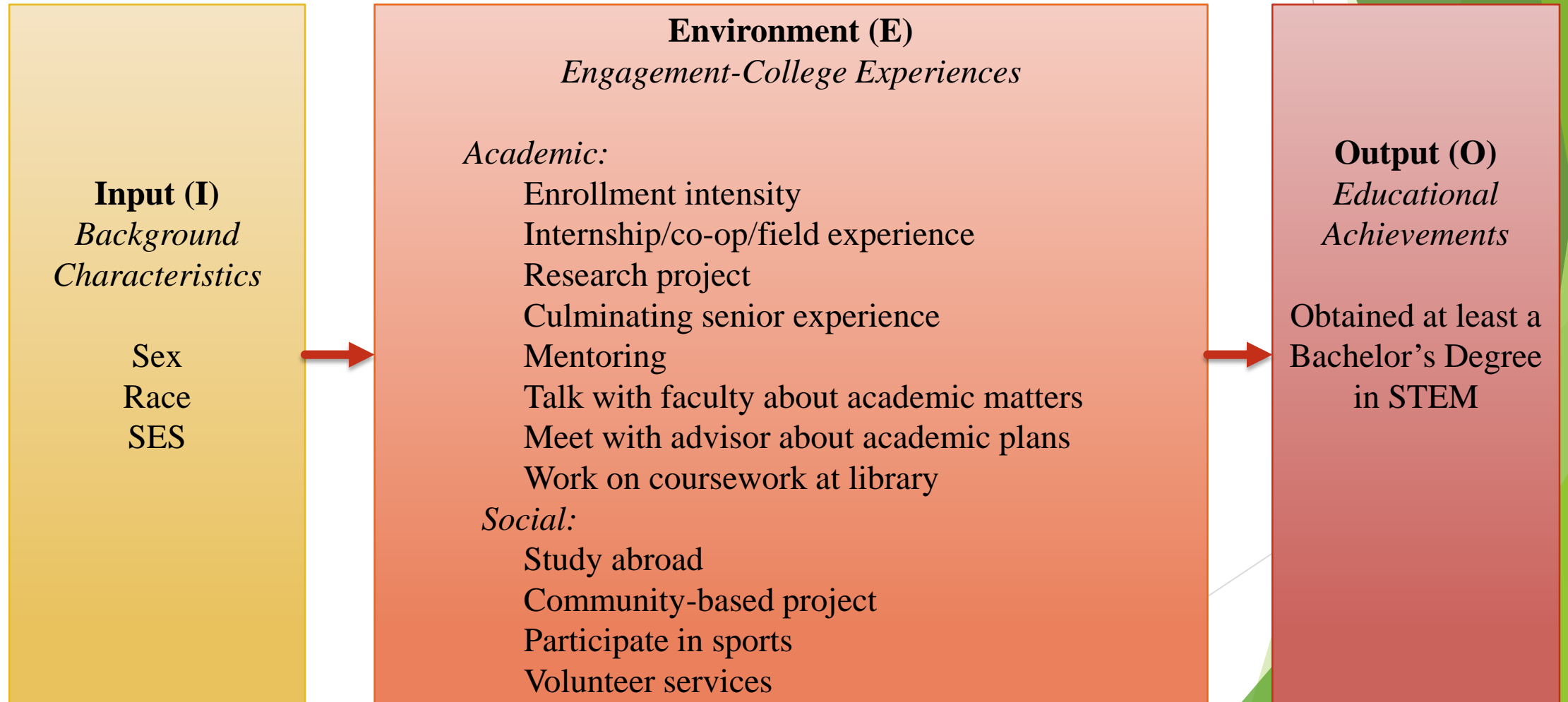
## Purpose & Research Question

- ▶ Purpose: To examine what college engagement factors predict baccalaureate degree attainment in STEM among community college transfer students.
- ▶ RQ: For community college transfer students, how is their *academic and social engagement in college*, along with demographic and academic background, related to the probability of their *baccalaureate degree attainment* in STEM fields of study?

# Literature on Engagement

- ▶ Among community college students, student academic and social engagement was shown to positively correlate with retention and persistence to graduation (Bahr, 2008; Karp et al, 2010; Lundberg, 2014; Pascarella et al., 1986; Songer, 2011).
- ▶ Transfer students' engagement
  - ▶ Seeking academic and student services (Ellis, 2013)
  - ▶ Faculty (D'Amico et al., 2014);
  - ▶ Class participation (Fauria & Fuller, 2015; Townsend & Wilson, 2016)
- ▶ Transfer students were found to be not as engaged as native students at the 4-year institution (Ishitani & Mckitrick, 2010).
- ▶ Engagement of transfer students in STEM
  - ▶ STEM courses (Myers et al; 2015; Wang, 2015)
  - ▶ Faculty and advisors (Jackson & Laanan, 2015; Kruse, 2015)
  - ▶ Research opportunities (Hirst et al., 2014; Straw & Livelybrooks, 2012) → STEM aspiration;
  - ▶ Adjustment at the 4-year institution (Carlos & Lopez, 2016)

# Theoretical Framework: I-E-O Model (Astin, 1993)



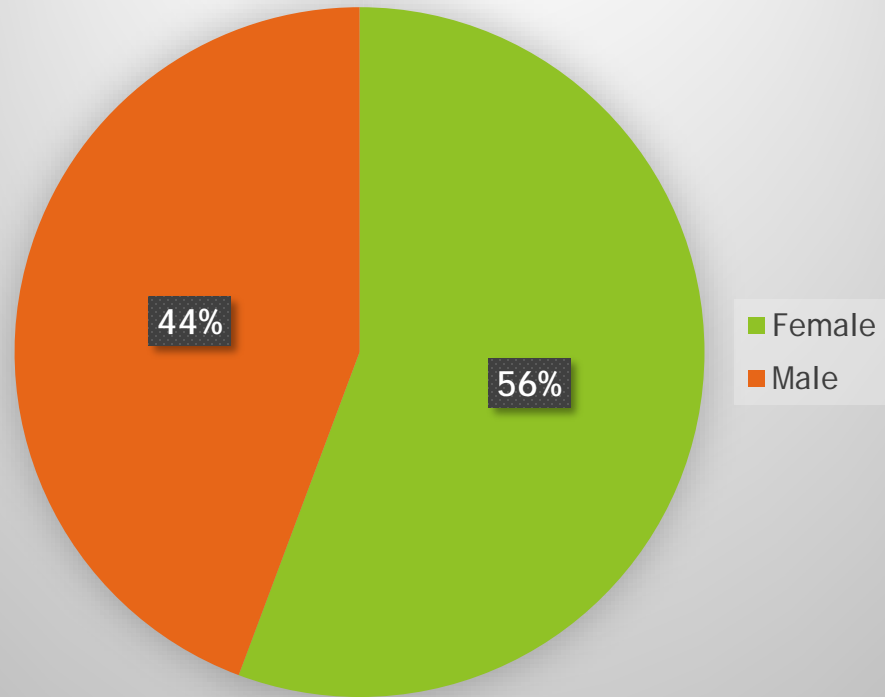


# Data Analysis

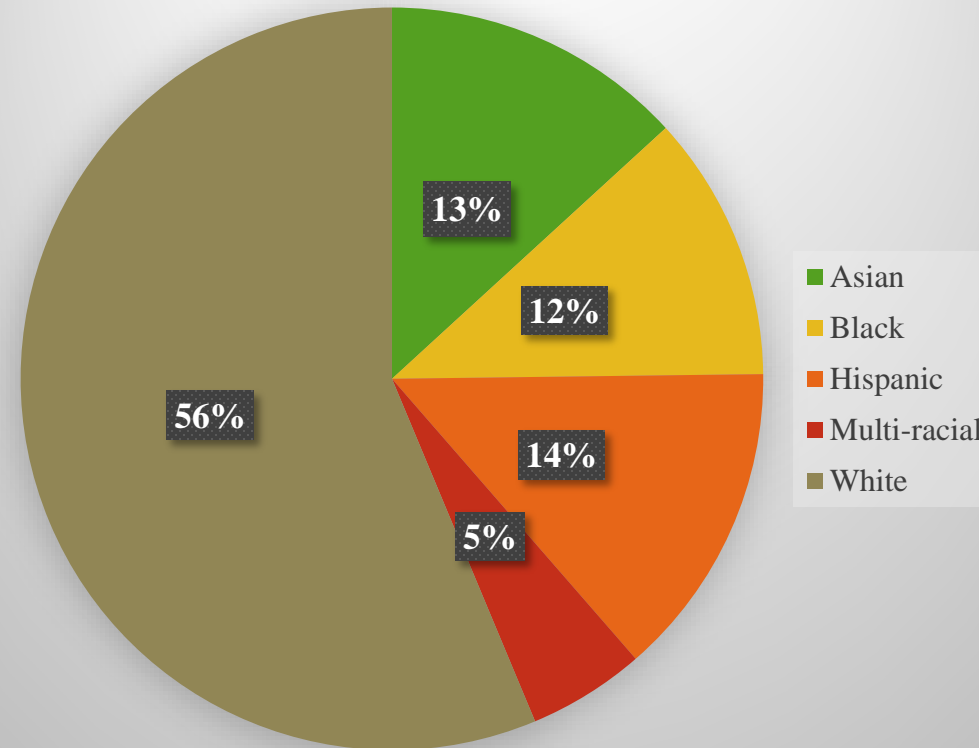
- Data: Education Longitudinal Study of 2002 (ELS:2002)
- 1761 community college transfer students
- Descriptive analysis
- Logistic regression

# Findings: Background Characteristics

## Gender



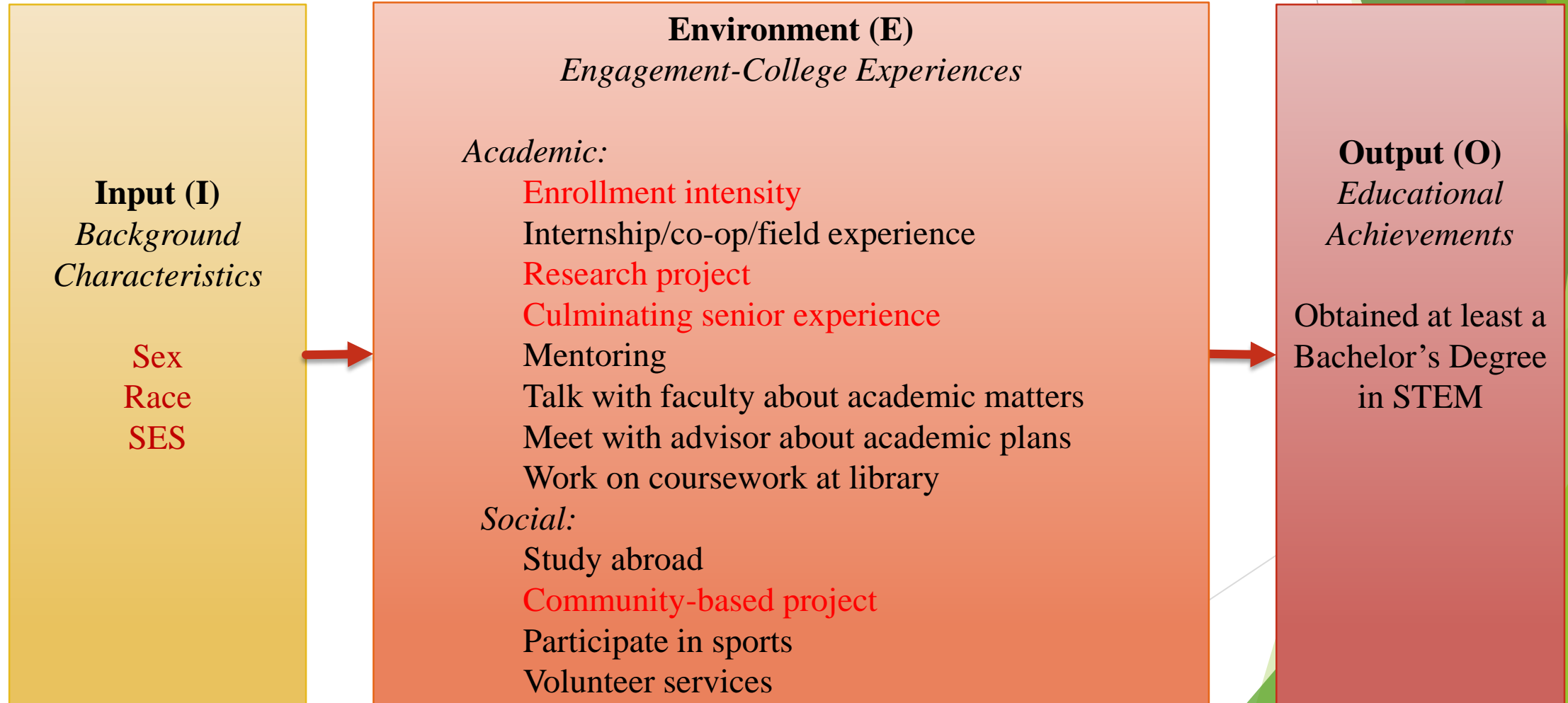
## Race/Ethnicity



# Findings: Background Characteristics



# Findings: What engagement factors matter?



## Findings: Background

Variables	$\beta$	Wald	p	Odd Ratios	Inverse Odd Ratios
Gender (Female)	.405	8.670	.003**	1.500	
Race (Asian)	.671	13.409	.000**	1.957	
Race (Black)	-.558	4.791	.029*	.572	1.75
Race (Hispanic)	-.215	1.026	3.11	.806	1.24
Race (Other)	.132	.193	.660	1.142	
SES	.213	4.709	.030*	1.238	

# Findings: Academic Engagement

Variables	$\beta$	Wald	p	Odd Ratios	Inverse Odd Ratios
Enrollment	.516	26.351	.000***	1.676	
Intern	.233	2.617	.102	1.262	
Research	.736	14.018	.000***	2.087	
Senior Experience	.387	6.531	.011*	1.473	
Mentoring	.197	1.111	.292	1.272	
Talk with faculty	-.014	.016	.899	.986	1.01
Meet with advisor	-.056	.248	.618	.945	1.06
Work on coursework at library	.172	3.328	.068	1.187	

## Findings: Social Engagement

Variables	$\beta$	Wald	p	Odd Ratios	Inverse Odd Ratios
Study abroad	-.300	1.442	.230	.741	1.35
Community-based Project	.366	4.766	.029*	1.443	
Intramural sports	.078	.378	.539	1.081	
Intercollegiate sports	-.220	2.535	.111	.802	1.25
Other extracurricular activities	.053	.284	.594	1.054	

# Implications & Conclusion

- ▶ There needs to be policies and practices aiming to help minority, especially Black, and low SES students to attain better educational outcomes (critical for Texas!)
- ▶ Higher education institutions need to seek to understand what hinder students' full- time enrollment and make effort to foster enrollment intensity.
- ▶ Students should be encouraged to participate in research projects, especially in senior years, and community-based projects.
- ▶ More research needed to understand the experience of transfer minority students in STEM programs.
- ▶ Future research should investigate the experiences of non-traditional age transfer STEM students that lead to degree attainment. The use of ELS:2002 only helps explain the experience of traditional-aged college students.



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# Thank You!

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