

# The Biology Pipeline: Understanding the Persisters, Leavers, and Joiners

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Indiana College Biology Teachers Association  
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# Overview

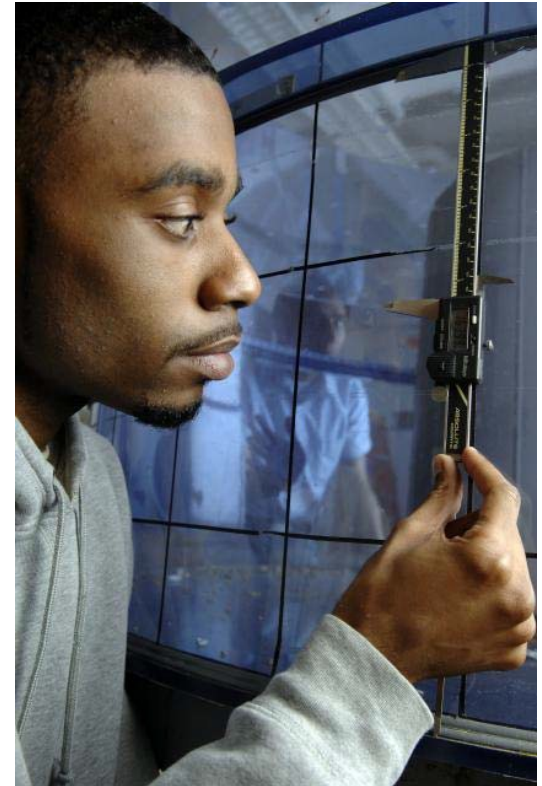


- NSSE and Student Engagement
  - Why it matters
- First-year experiences and persistence
  - How many potential biology majors don't make it past the first year?
- Biology: Persisters, joiners, and leavers
  - Engagement and HIP
- Summary and Discussion

# What is Student Engagement?

The extent to which students are exposed to and participate in effective educational practices

- Educationally purposeful activities and practices
- Empirically linked to desired outcomes

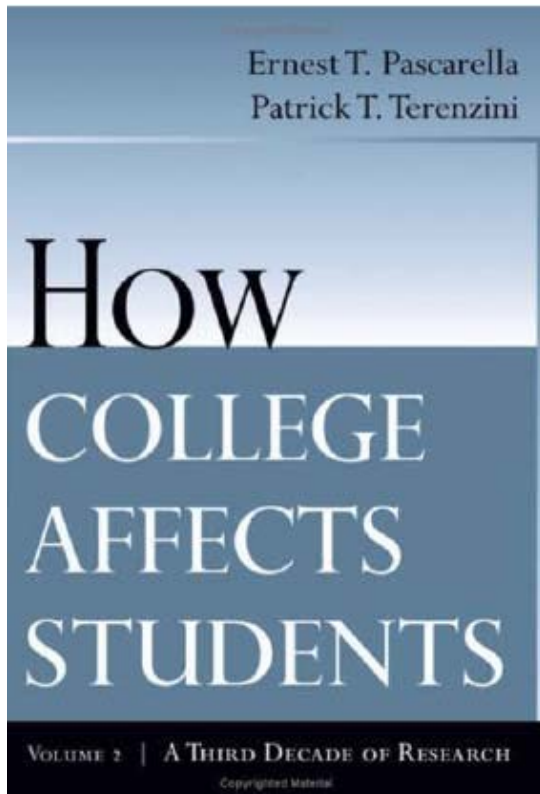


# Ok, but what *is* engagement?

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- **Challenging academic work**
  - ◆ High expectations
  - ◆ Deep approaches to learning
- **Enriching learning activities**
  - ◆ Collaborative learning
  - ◆ High-impact practices
- **Quality involvement with faculty**

# Why does it matter?



The impact of college is largely determined by individual effort and involvement in the academic, interpersonal, and extra-curricular offerings on a campus. It is important to focus on the ways an institution can shape its offerings to encourage *student engagement*.

Paraphrased from  
Pascarella & Terenzini (2005), p. 602

# NSSE in the US



- Administered annually to hundreds of baccalaureate level institutions across the US.
- Since 2000, approximately 5.5 million undergraduate students enrolled at more than 1,600 institutions have completed NSSE.

# NSSE in Indiana

**Anderson University\***  
**Ball State University\***  
**Butler University\***  
**Calumet College of Saint Joseph\***  
**DePauw University\***  
**Earlham College\***  
**Franklin College\***  
**Goshen College\***  
**Grace College and Theological Seminary\***  
**Hanover College\***  
**Harrison College-Indianapolis**  
**Holy Cross College\***  
**Huntington University**  
**Indiana Institute of Technology\***  
**Indiana State University**  
**Indiana University Bloomington\***  
**Indiana University East\***  
**Indiana University Kokomo\***  
**Indiana University Northwest\***  
**Indiana University South Bend\***  
**Indiana University Southeast\***  
**Indiana University-Purdue University Indianapolis\***  
**Indiana University-Purdue University Fort Wayne**

**Indiana Wesleyan University**  
**Manchester University\***  
**Marian University\***  
**Martin University**  
**Purdue University**  
**Purdue University Calumet**  
**Purdue University North Central**  
**Purdue University Northwest\***  
**Rose-Hulman Institute of Technology\***  
**Saint Joseph's College**  
**Saint Mary-of-the-Woods College**  
**Saint Mary's College**  
**Taylor University\***  
**Taylor University Fort Wayne**  
**Trine University**  
**University of Evansville\***  
**University of Indianapolis\***  
**University of Saint Francis-Fort Wayne\***  
**University of Southern Indiana**  
**Valparaiso University\***  
**Wabash College\***

\* Participated in 2017 and/or registered for 2018

# The First-Year Experience



- The first year is crucial to student success.
  - ✓ Even with first year programs and other dedicated resources specifically aimed at helping first year students succeed, persistence to the 2<sup>nd</sup> year is about 80%.



# The First-Year Experience



- The first year is crucial to student success.
  - ✓ Even with first year programs and other dedicated resources specifically aimed at helping first year students succeed, persistence to the 2<sup>nd</sup> year is about 80%.
  - ✓ How many of you assist with first year programs on your campus? Teach first-year classes?

# The First-Year Experience

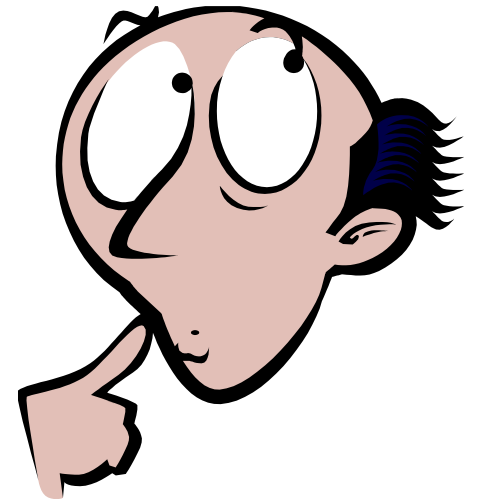
What percentage of students indicated that they “seriously considered leaving” at some point during the first year of college?

14%

27%

36%

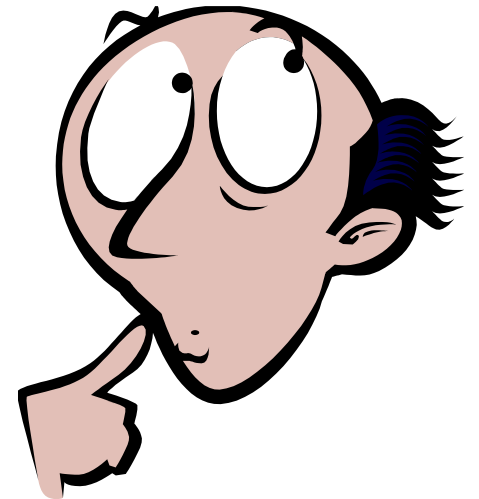
44%



# The First-Year Experience

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36%



# The First-Year Experience



## Top 5 reasons for leaving

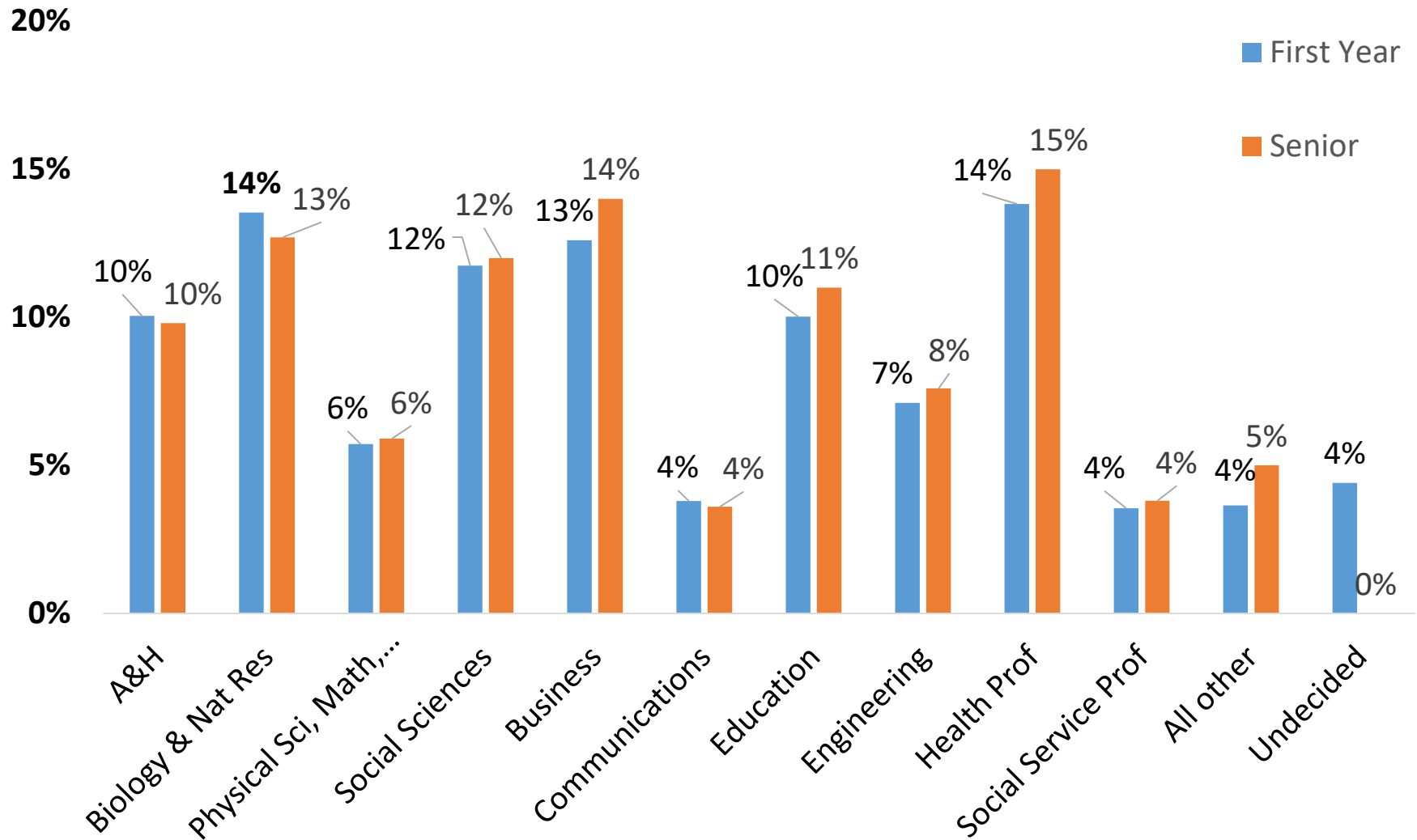
1. Financial concerns (49%)
2. Personal reasons (36%)
3. Campus Climate (32%)
4. Relations with other students (26%)
5. Not enough opportunities to socialize and have fun (22%)

# The First-Year Experience

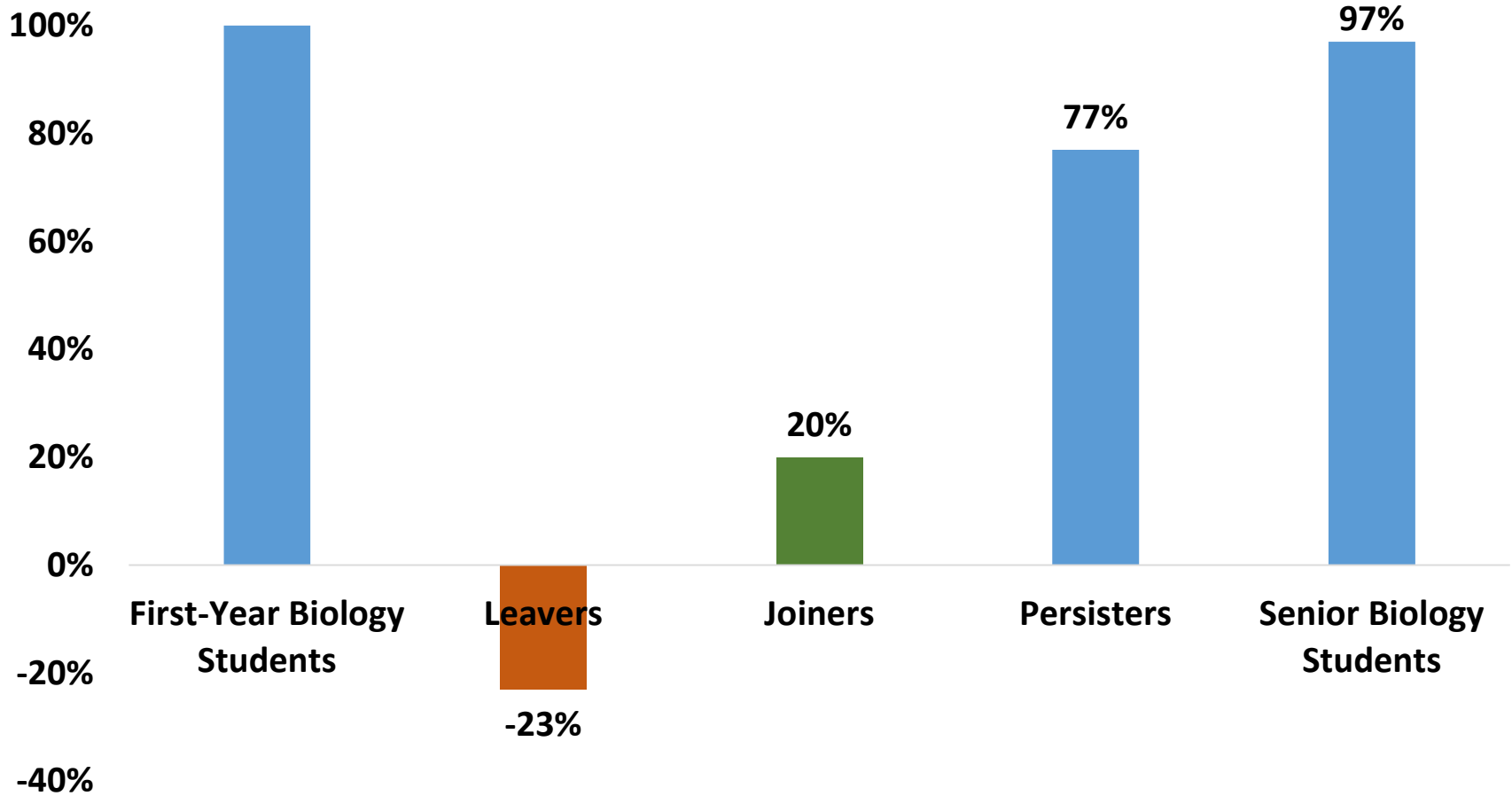


- 6 year graduation rate is about 59%.
  - ✓ How many biology majors were part of that 41% that did not graduate?

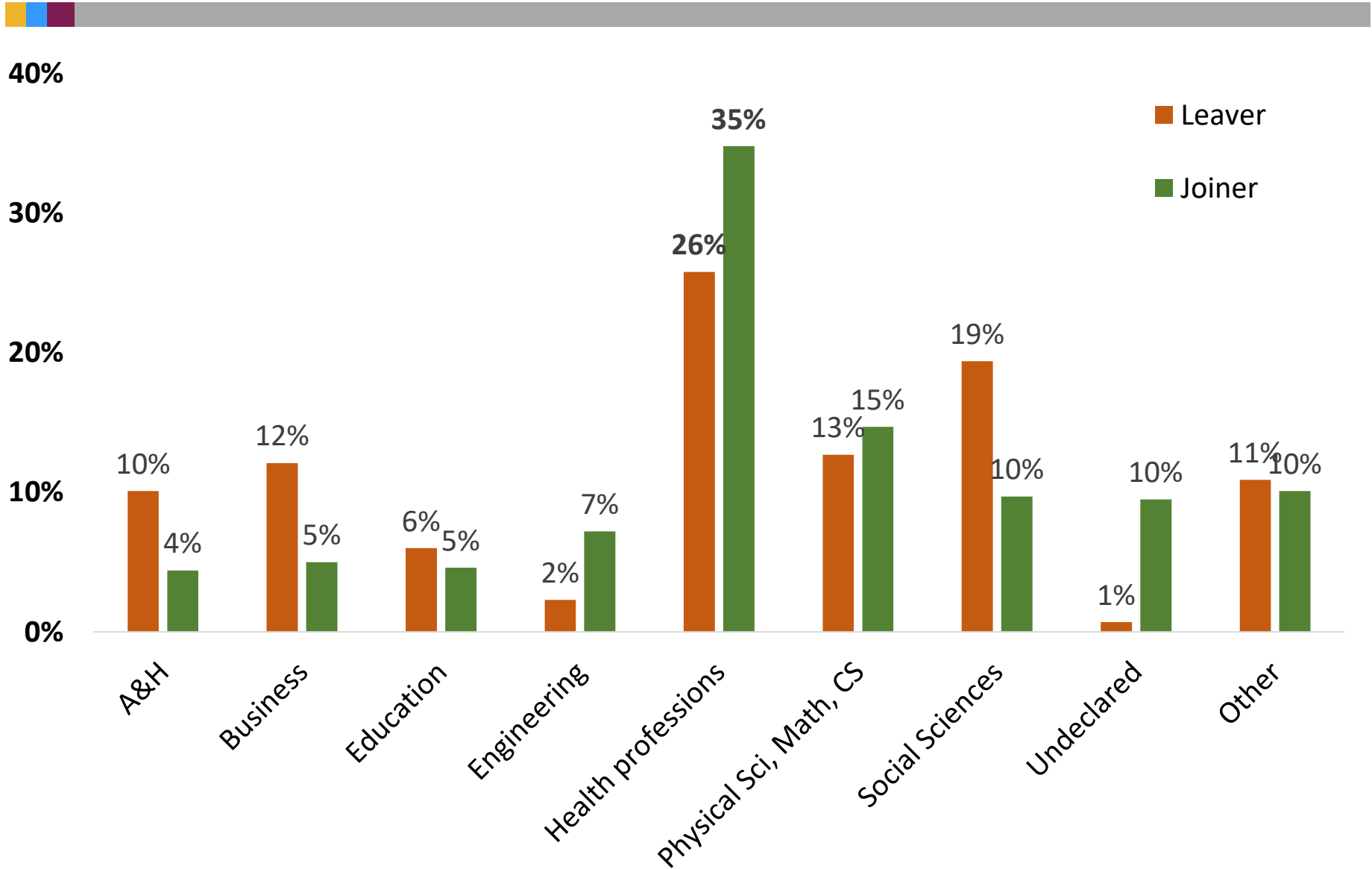
# Biology is a popular major!



# Persisters, Joiners and Leavers

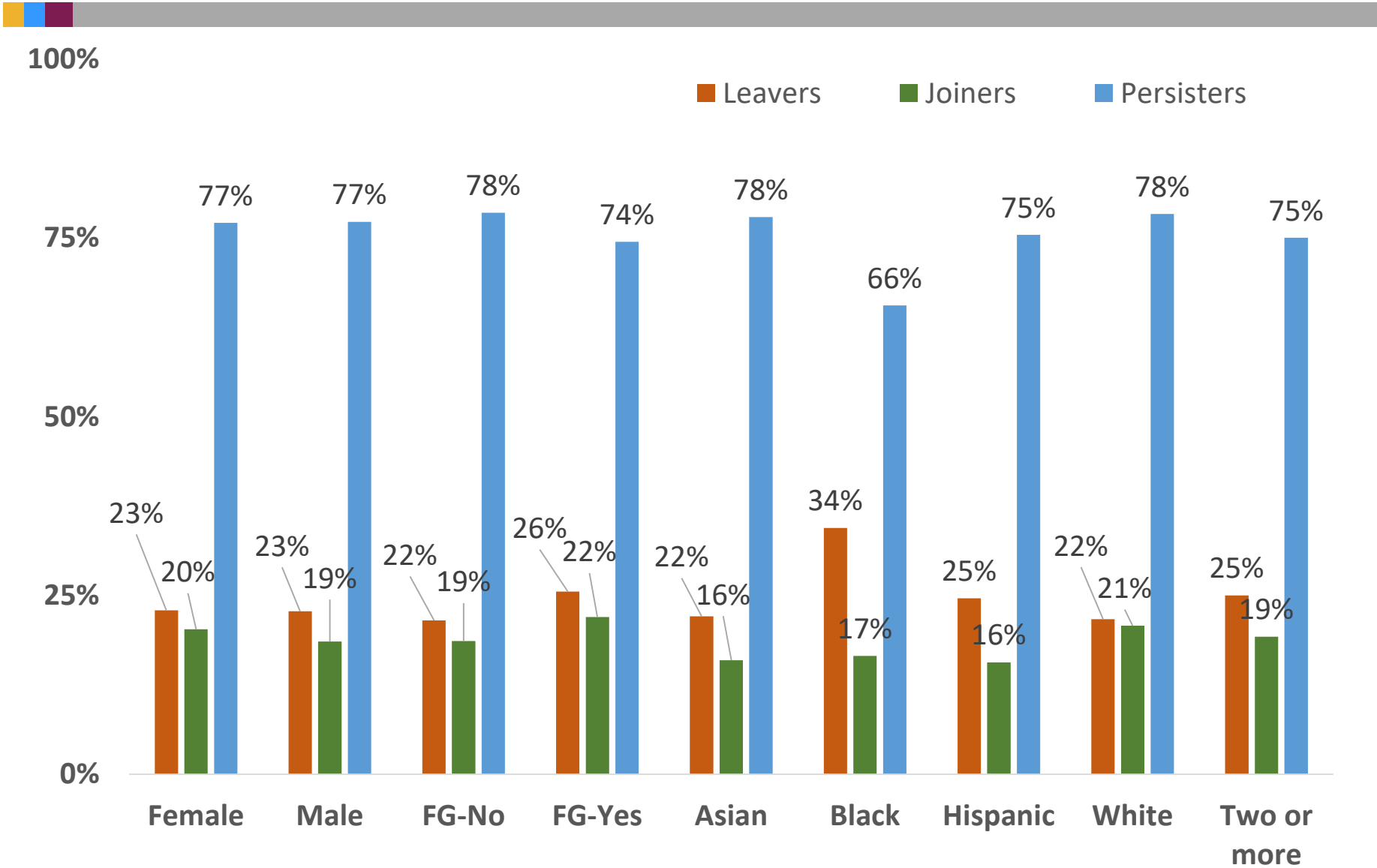


# Joiners and Leavers



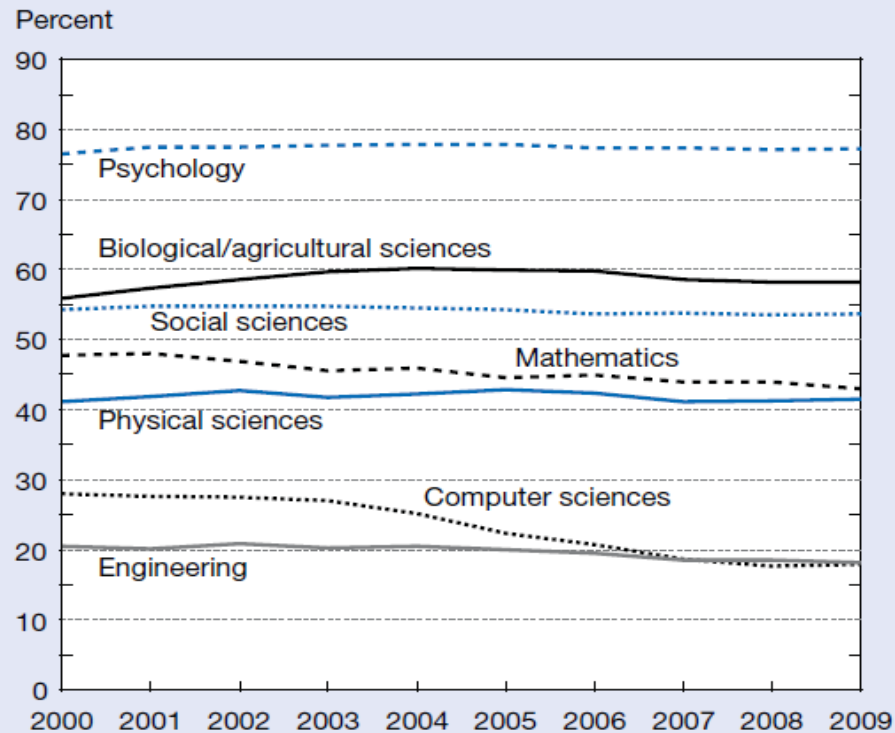


# Joiners and Leavers



# Women in Biology

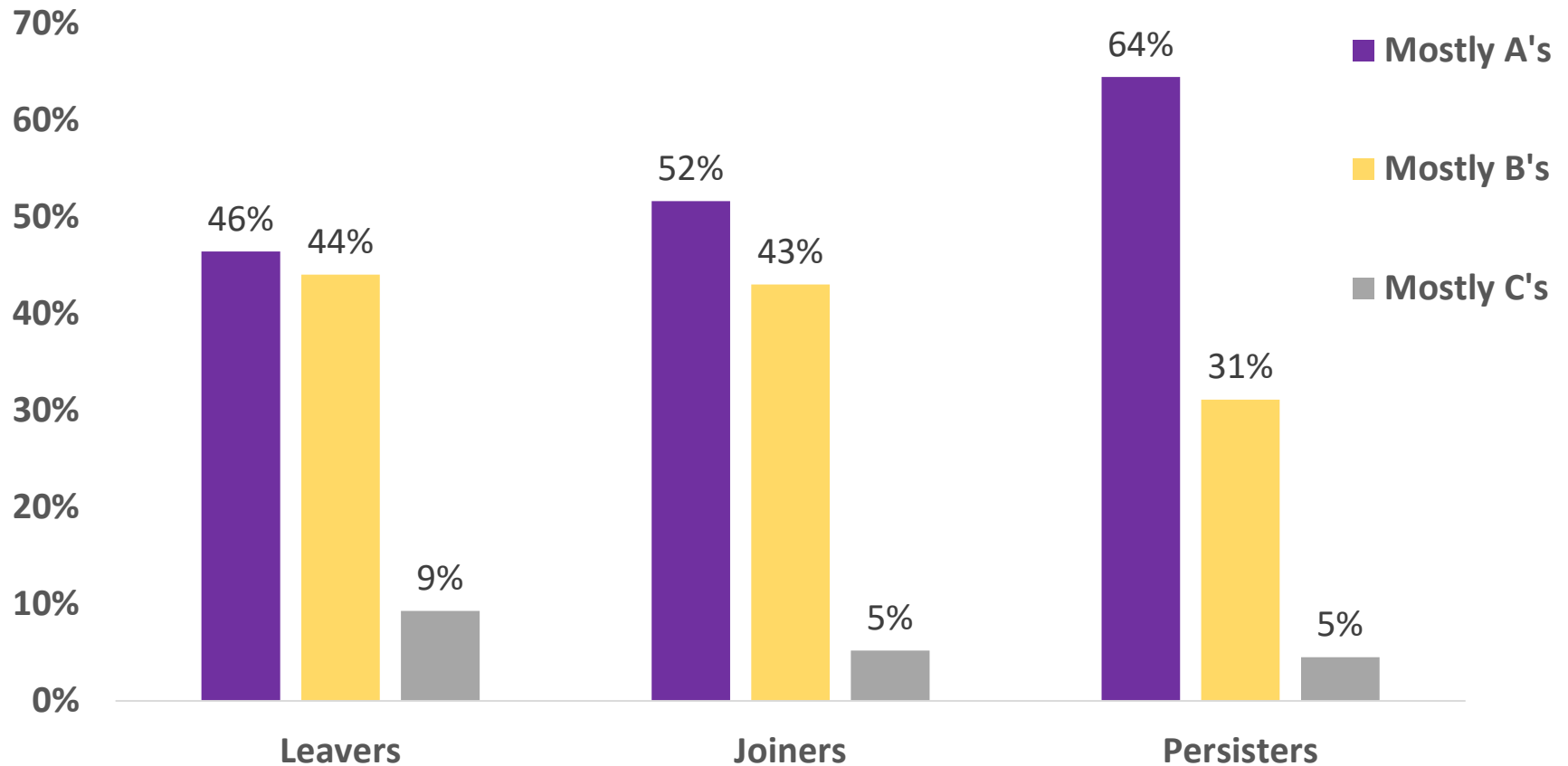
Figure 2-14  
**Women's share of S&E bachelor's degrees, by field:  
2000–09**



NOTE: Physical sciences include earth, atmospheric, and ocean sciences.

SOURCES: National Center for Education Statistics, Integrated Postsecondary Education Data System, Completions Survey; and National Science Foundation, National Center for Science and Engineering Statistics, WebCASPAR database, <http://webcaspar.nsf.gov>. See appendix table 2-18.


# Persisters, Joiners and Leavers



# High Impact Practices

## Work with a faculty member on a research project

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	First Year		Senior YR
	DNP	Plan/Done	Done
Leavers	41%	59% 	38%

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# High Impact Practices

## Work with a faculty member on a research project

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	First Year		Senior YR
	DNP	Plan/Done	Done
Leavers	41%	59%	38%
Joiners	51%	48%	46%

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# High Impact Practices

## Work with a faculty member on a research project

	First Year		Senior YR
	DNP	Plan/Done	Done
Leavers	41%	59%	38%
Joiners	51%	48%	46%
Persisters	31%	69%	59%



# High Impact Practices

**Participate in an internship, co-op, field experience, etc**

	First Year		Senior YR
	DNP	Plan	Done
Leavers	12%	88%	 59%
Joiners			
Persisters			

# High Impact Practices




**Participate in an internship, co-op, field experience, etc**

	First Year		Senior YR
	DNP	Plan	Done
Leavers	12%	88%	 59%
Joiners	16%	84%	 49%
Persisters			



# High Impact Practices

**Participate in an internship, co-op, field experience, etc**

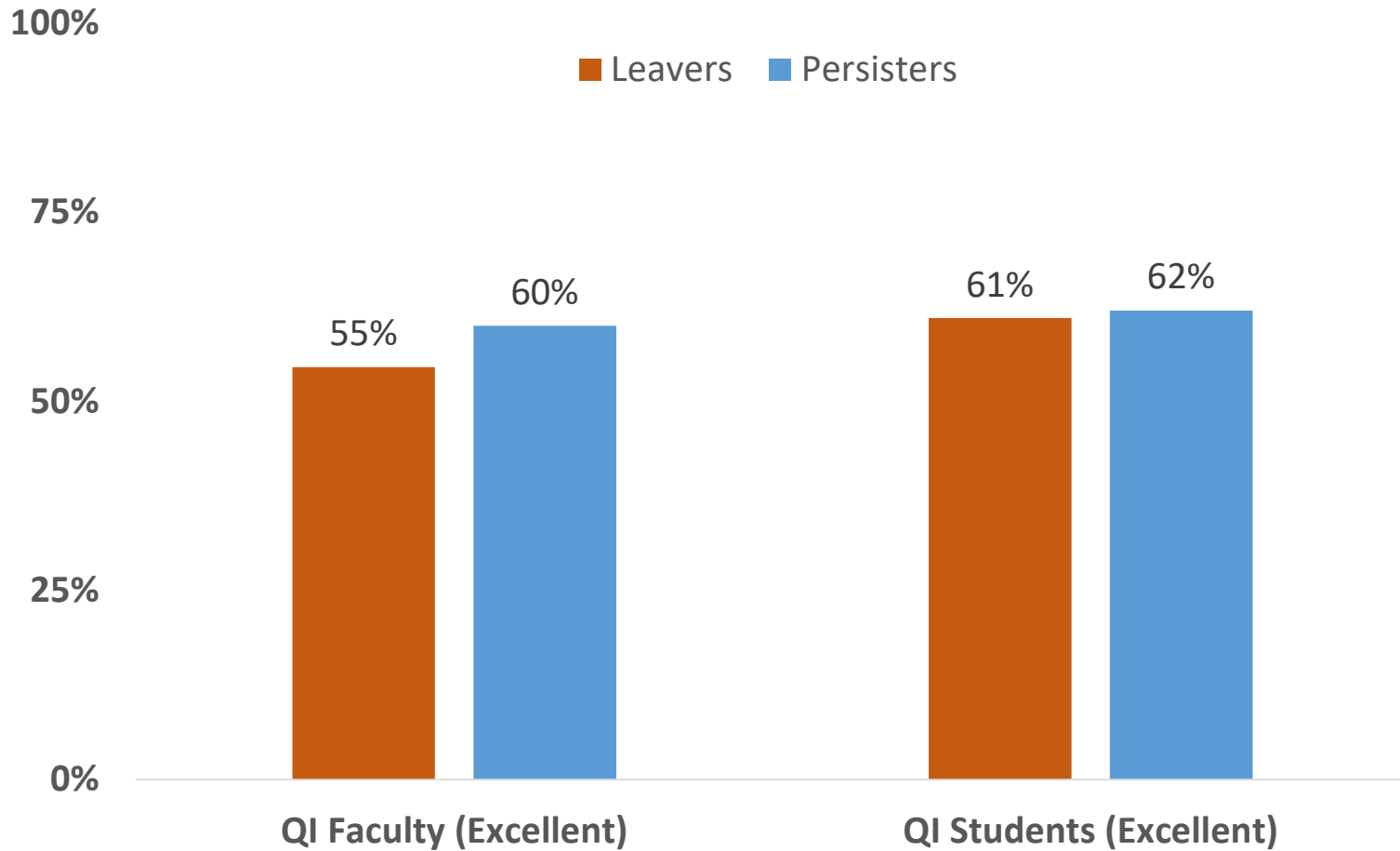
	First Year		Senior YR
	DNP	Plan	Done
Leavers	12%	88%	 59%
Joiners	16%	84%	 49%
Persisters	12%	88%	 60%

# Hours studying

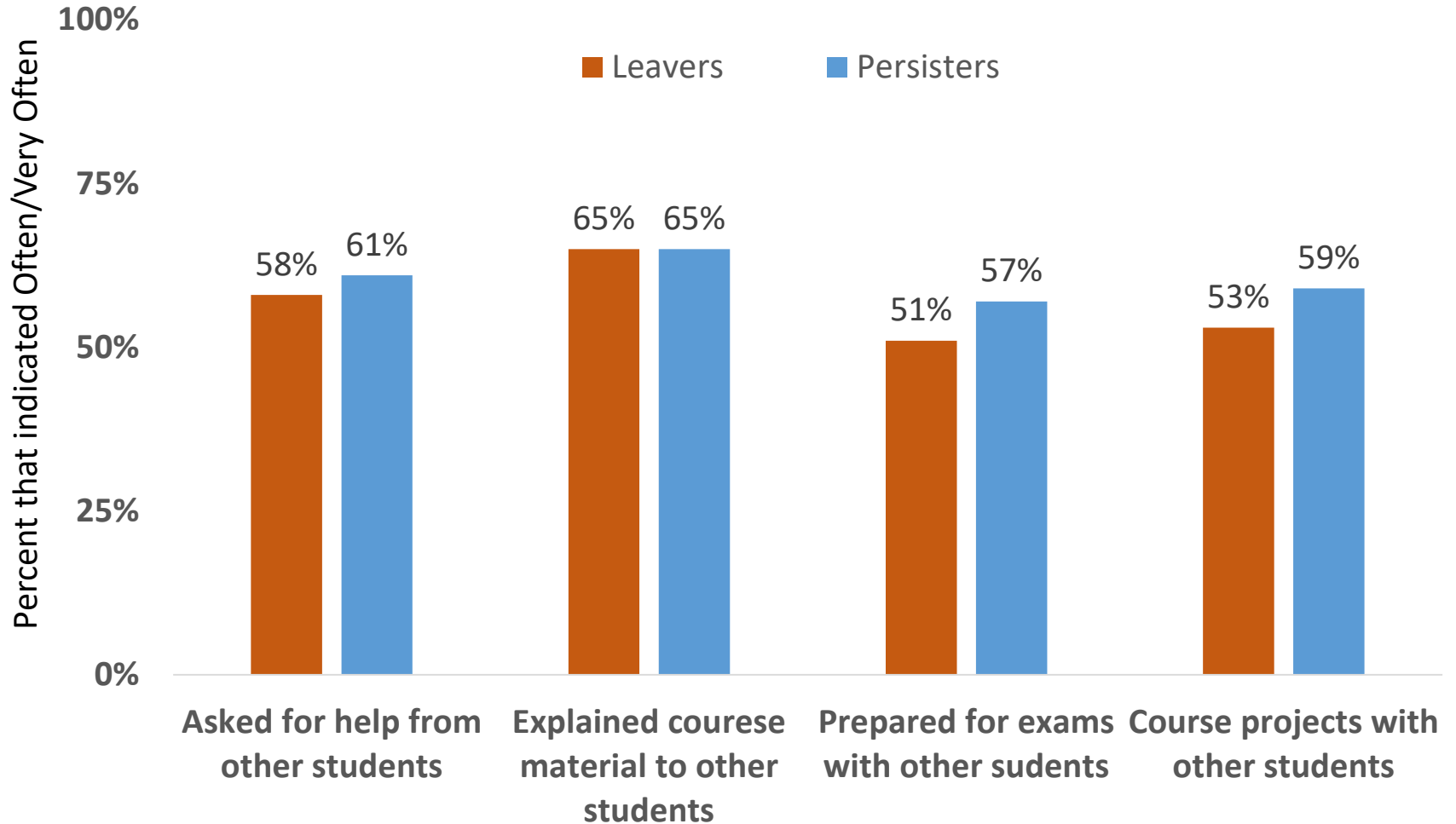
## Hours studying the first year of college

	21+ hrs
Leavers	32%
Joiners	33%
Persisters	39%

# Quality of Interactions



# Peer Collaboration



# Summary and Discussion



- Most students (77%) that start as a biology major persist through to their senior year as a biology major.
- About 22% leave the major at some point, but almost equal number joins (20%).
- Almost half of the Leavers went to health professions (26%) or social sciences (19%).
- One half of Joiners came from health professions (35%) or physical science, math, and computer science (15%).
- Very small differences in leaving or joining between gender and first generation students. However, Black students were less likely to persist compared to other students.

# Summary and Discussion



- Persisters had higher academic achievement (grades and hours studying).
- Persisters were more likely to plan on and participate in a research project with a faculty member.
- Persisters were slightly more likely to indicate higher quality of interactions with faculty and generally higher engagement with their peers.

# Thank you

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