Update and Open Discussion on Educational Experiments

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MIT Faculty Meeting
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Overview

Motivation and **Data** from Phase I 2018/2019 P/NR GIR Policy Experiment

Proposal from Faculty Officers: "Discovery" Subjects

Spring & Fall 2018 **CUP Discussions** of Early Sophomore Standing (ESS)

2019/2020 Phase Two Educational Policy Experiment

- **Continue up to three deferred P/NR science core GIR opportunities**
- **Discovery units *separate* from credit limit**
- **Credit limit adjustments and major advising opportunities to replace ESS**

Fall: 48 + 9 Discovery **Spring: 60 + 9 Discovery**

Enable/encourage *both* "Exploration" and/or "Discovery" in the First Year

Increased confidence and satisfaction in major selection?

Improved First Year student experience?

Improved long-term educational outcomes?

Phase One Experiment and Data

Phase One Experiment: Up to three science core GIRs may be taken P/NR after first semester

- Control Group (students entering Fall 2017)
- Test Group (students entering Fall 2018)
- Messaging: First Year is a time for exploration
- Improved roadmaps for majors: ensure awareness of timing of Science Core GIRs needed for majors
- Development of more exploratory options
  - Initial list from departments had 190 subjects
  - OVC identified First Year UROP coordinators for departments and other opportunities

What do we know so far?

Students are exploring to an increased degree

Small positive change in Fall hidden grades.

Different approaches and needs of students with respect to First Year

"focused", "open/focused", and "open" students

Discovery vs. Exploration

- Now understand that these are different
- Barriers to Discovery remain for significant number of our students

Change in Fall 2018 semester science core GIRs taken under experimental policy

Advanced credit	Fall 2017					Fall 2018				
	0	1	2	3	4	0	1	2	3	4
0	0%	0%	4%	91%	5%	0%	2%	31%	67%	1%
1	0%	0%	9%	90%	3%	0%	2%	44%	53%	0%
2	0%	3%	36%	62%	0%	1%	17%	50%	32%	0%
3+	14%	33%	45%	9%	0%	38%	33%	26%	3%	0%
Total	2%	5%	16%	74%	3%	6%	10%	39%	44%	0%

X	Fall 2017	Fall 2018
0	27%	22%
1	42%	42%
2	17%	19%
3+	13%	16%

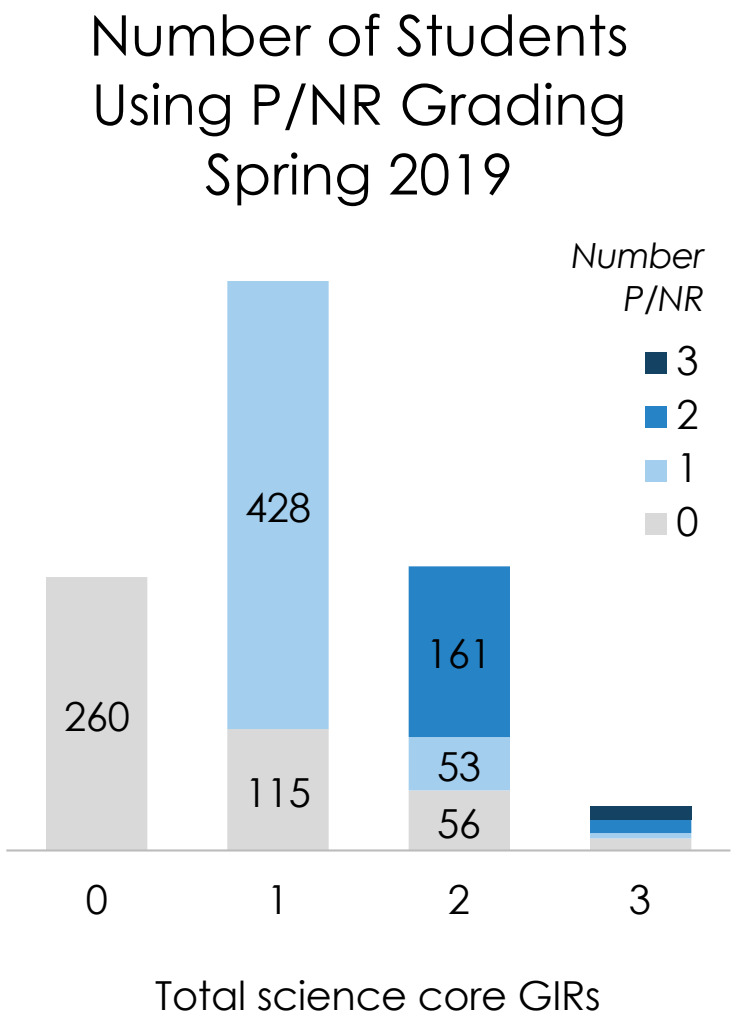
Percent of students with X science core GIR credits through AP/AS/TC

Roughly every other student took one fewer science core GIR in FA18 than in FA17

Spring 2019 data

184 fewer science core GIRs in SP19 compared to SP18. Combined with 538 from FA18, indicates about 2/3rds of students have delayed one science core GIR

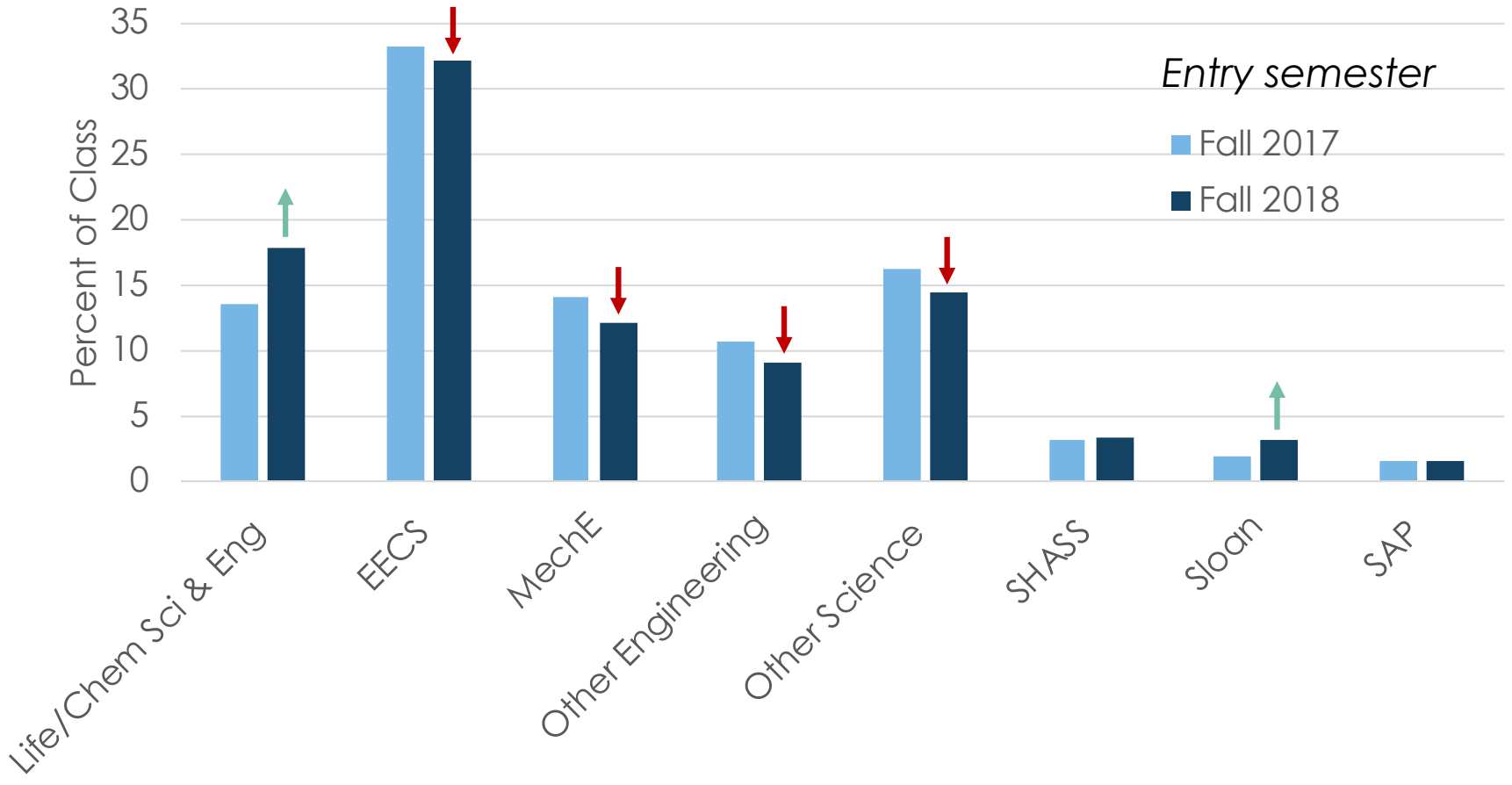
Roughly 2/3 of students have elected P/NR grading for one or more science core GIRs in SP19



Registration data as of Add Date of stated term.

Major selection – by broad field

Initial data below, more analysis to come



Arrows indicate change of at least 1%. Enrollment in joint majors divided between categories.

We are conscious of the MIT and national long-term trends related to stress and workload

Relative to 2015 a greater proportion of **first-years** currently report…

Feeling overwhelmed by all they had to do

2015: 49% (15% very often + 34% often)

2019: 65% (30% very often + 35% often)

Staying up all night to work

2015: 17% (6% very often + 11% often)

2019: 28% (14% very often + 14% often)

Feeling very sad

2015: 19% (6% very often + 13% often)

2019: 25% (10% very often + 15% often)

Feeling so depressed it was difficult to function

2015: 8% (3% very often + 5% often)

2019: 12% (6% very often + 6% often)

Based on the Enrolled Student Survey (2015 and 2019) – survey conducted every four years

The data are even more concerning for upper level students

Relative to 2015 a greater proportion of **upper level students** currently report…

Feeling overwhelmed by all they had to do

2015: 61% (26% very often + 35% often)
2019: 73% (41% very often + 32% often)

Staying up all night to work

2015: 26% (11% very often + 15% often)
2019: 36% (16% very often + 20% often)

Feeling very sad

2015: 29% (11% very often + 18% often)
2019: 36% (16% very often + 20% often)

Feeling so depressed to was difficult to function

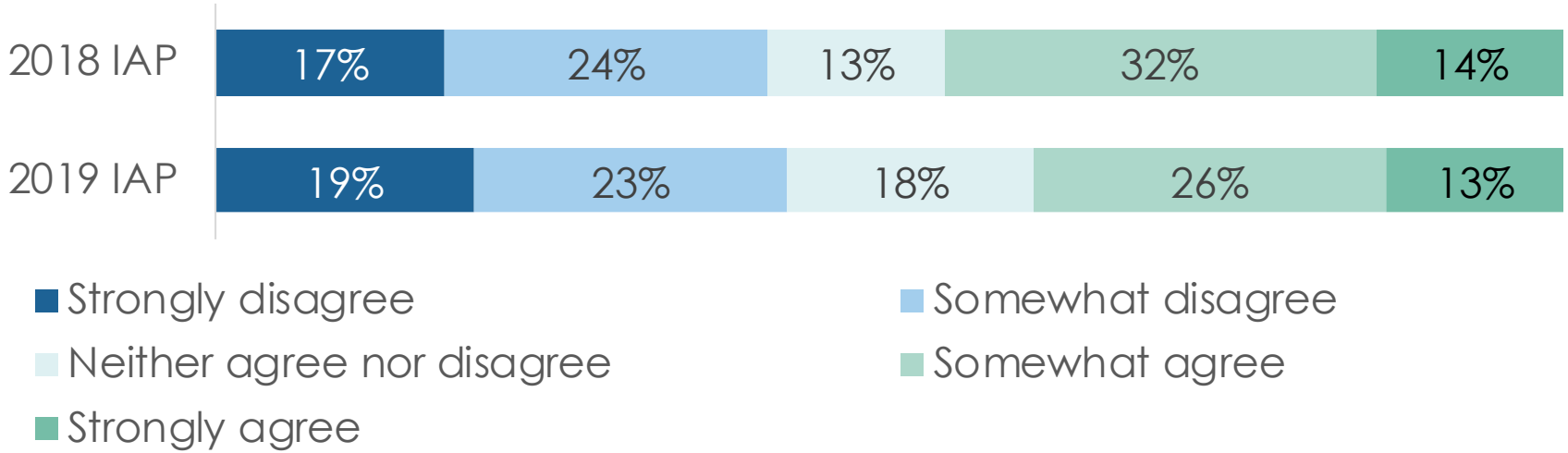
2015: 16% (7% very often + 9% often)
2019: 20% (10% very often + 10% often)

Based on the Enrolled Student Survey (2015 and 2019) – survey conducted every four years

Very limited information on student stress suggests the experimental policy may be a mitigating factor

"It's just a little bit of a reprieve, just like a safety net almost in that I don't have to worry about my grade point average."

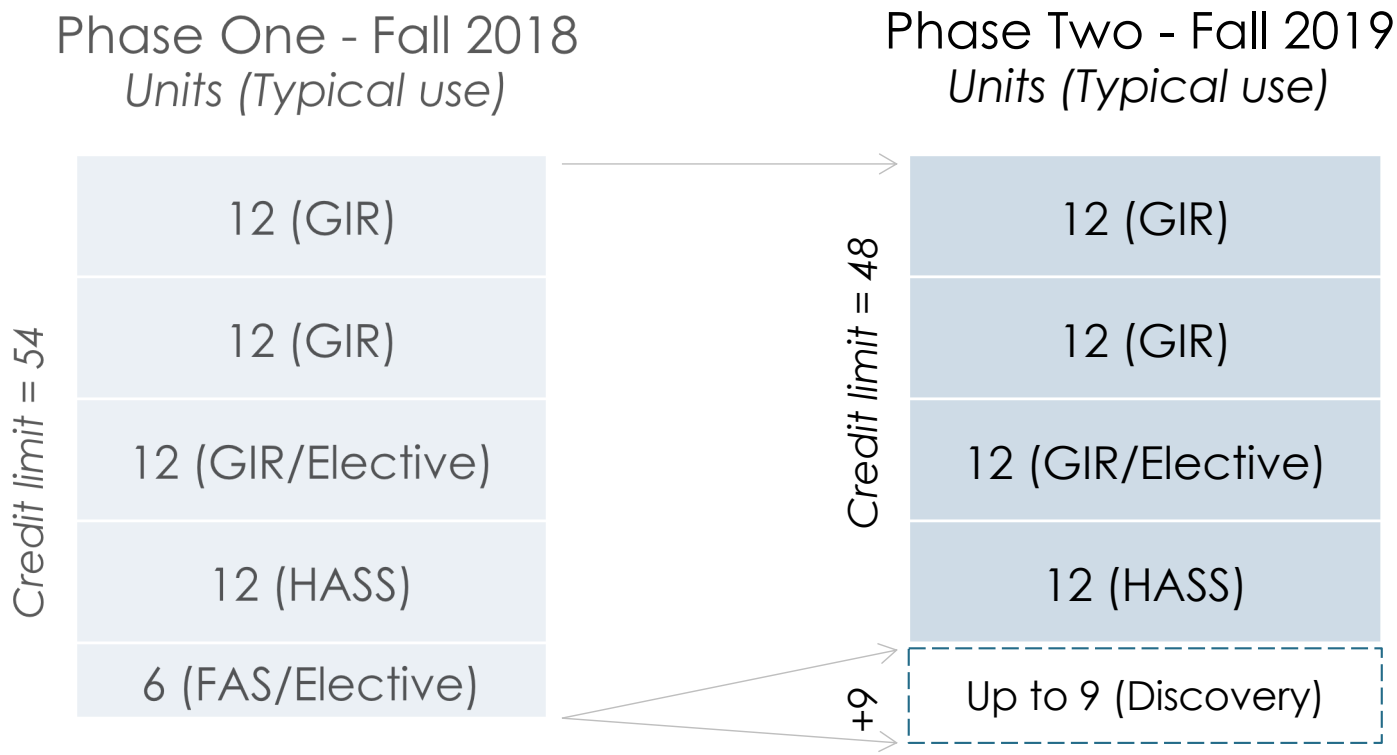
My level of stress about deciding on a major has increased since I have been at MIT.



Source: CUP Choice of Major Survey #3 2018 and FYX IAP Survey 2019 (January surveys)

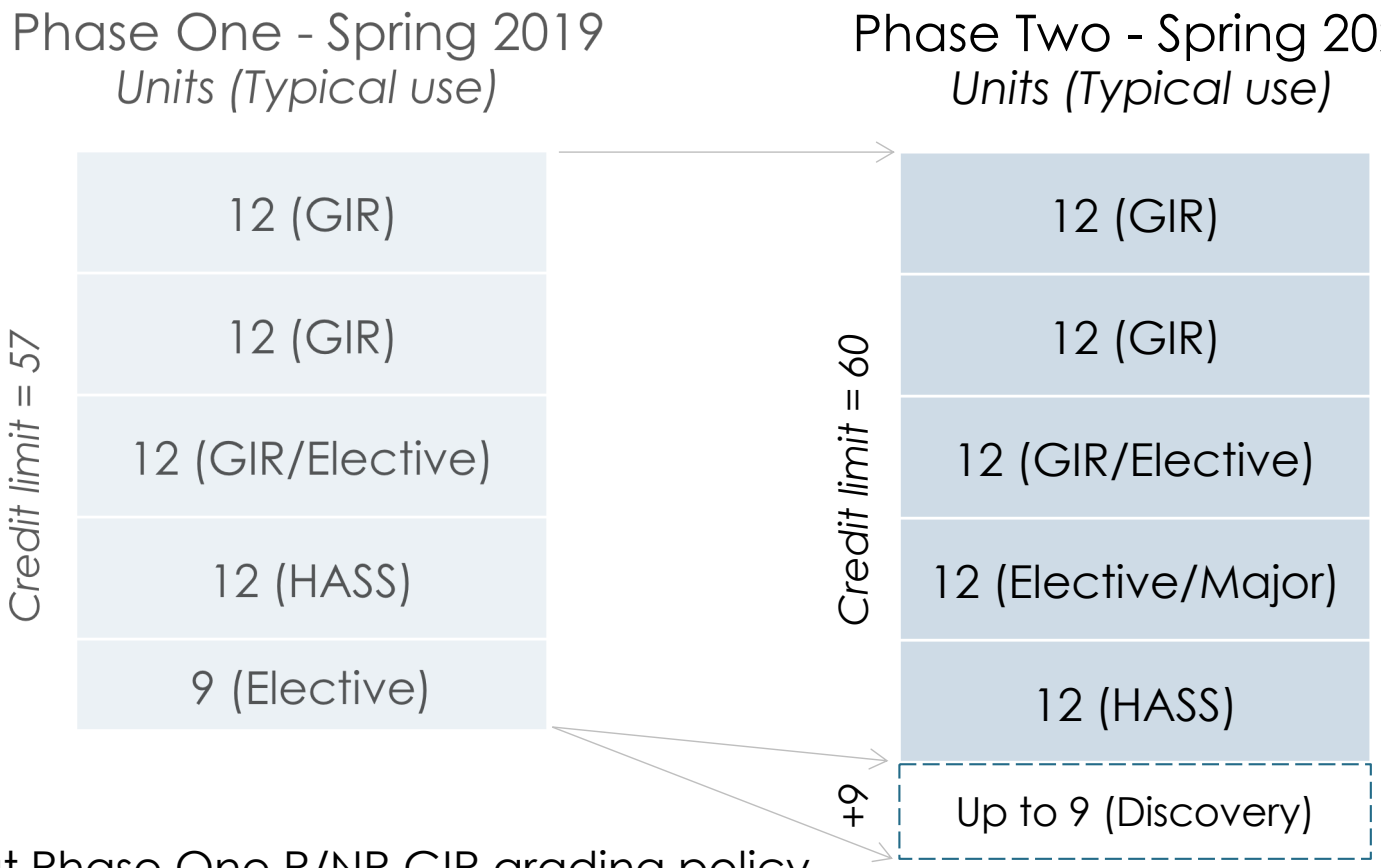
Phase Two Experiment

Phase Two Fall



1. Repeat Phase One grading policy (3 science core GIRs P/NR)
2. Fall semester credit limit modifications:
   A. Reduce general credit limit to 48 units
   B. Allow up to 9 additional "Discovery" units not counted against general credit limit for FYD, FAS, UROP subjects generally *not* eligible to satisfy degree requirements

Phase Two Spring



1. Repeat Phase One P/NR GIR grading policy
2. Spring semester credit limit modifications:
   A. Increase general credit limit to 60 units
   B. Allow up to 9 additional "Discovery" units
3. Replace Early Sophomore Standing (ESS) with option available to all First Year students to have extra advising in major
4. Remind students and advisors that 48 units is appropriate for most students even though they are permitted to take 60.

First-Year Discovery Subjects

- 1-3 units
- Graded P/D/F (P/NR under first-year grading rules)
- Does not satisfy any major, minor, or Institute requirement other than unrestricted elective credit
- Created for the primary purpose of helping first-year students discover majors, minors, HASS concentrations and/or fields of interest

New subjects for Fall 2019 can be reviewed by CoC until August 26. Info at https://ovc.mit.edu/fy

Discovery Subjects – Existing and Proposed for AY2020

1.008 Solving Big Engineering Problems
1.009 Climate Change
3.001 Introduction to Materials Science and Engineering
4.001 Where is and What is Architecture and Design
5.001 Frontiers in Molecular and Materials Science
10.000 Engineering Molecular Marvels: Careers and ChemE at MIT
12.00 Frontiers and Careers in Earth, Planets, Climate, & Life
12.12 Nature's Sandbox: The History of Ancient Environments, Climate, & Life
14.009 Economics and Society's Toughest Problems
15.000 Explorations in Management
20.S901 Exploring Majors at the Intersection of Engineering, Life Sciences & Medicine
21.00 SHASS Exploration
21G.012 Exploring Globalization through Chinese Food
STS.100/4.002/15.001/16.652 The Future: Global Challenges and Questions
SP.245 The Sum of all Courses
SP.361 Majors and Careers Through a Terrascope Lens

Discovery-Related Subjects and Exceptions

Other subjects eligible to count towards the 9 discovery-focused units are:

- 12.000 (9-unit fall Terrascope subject)
- Seminar XL
- Music performance subjects (6 units each)
- First-Year Advising Seminars (3 units each, >40 scheduled for Fall 2019)
- UROP for credit (up to 6 units per semester)

Pre-Major Departmental Advising

- Available to all interested students (and flexible to meet needs)
- OFY to support departments in developing a strategy
- Will vary to match department resources and style
  - Office hours
  - Online forums
  - Mixers
  - Scheduled appointments
  - And more…

Continued Data Collection for Both Phases

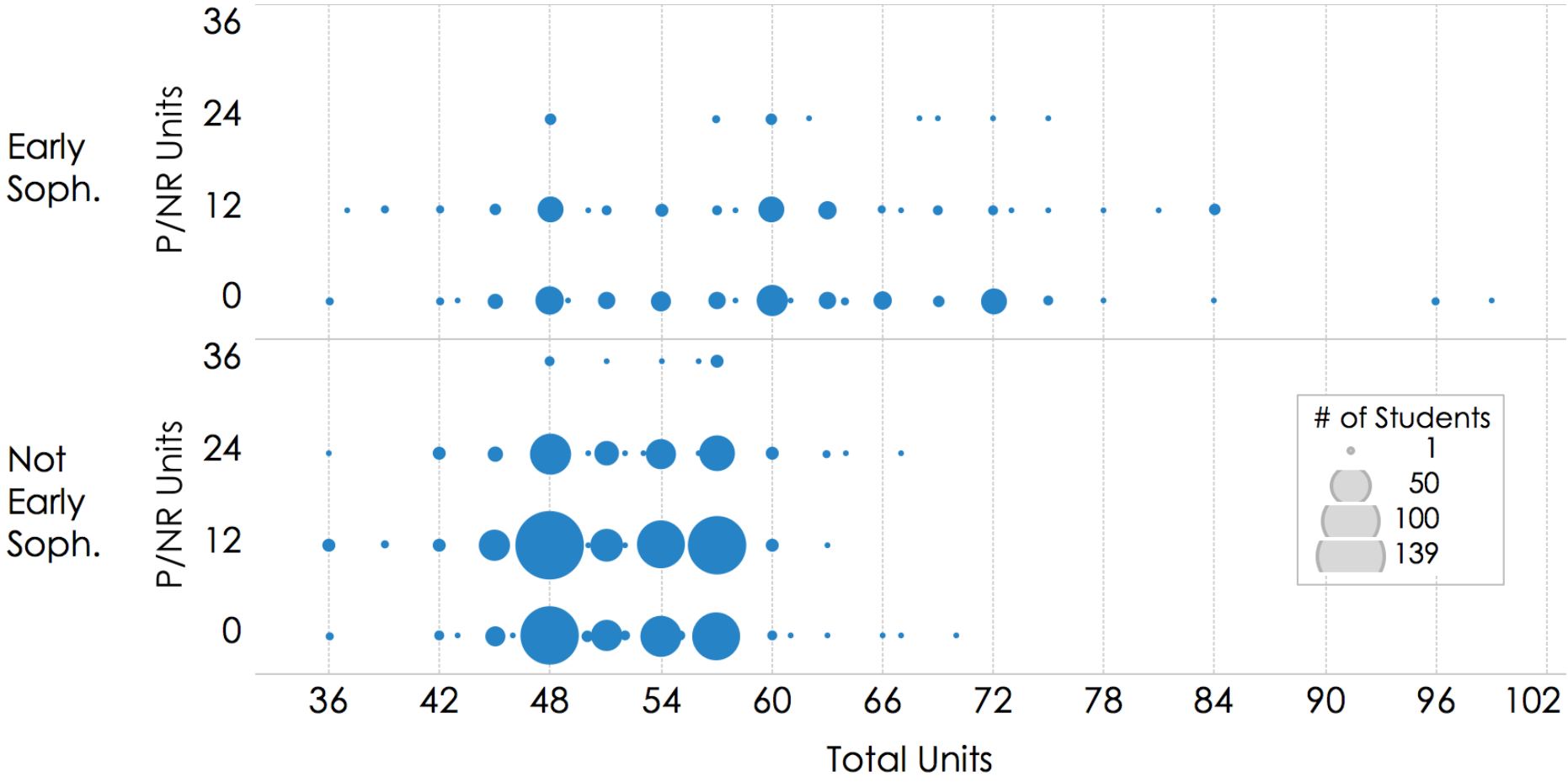
- Enrollment in Discovery and Exploration Subjects
- Science core GIR completion timing
- Distribution of subjects taken
- Science core GIRs on P/NR vs. on grades
- Number/timing of HASS, major, and other subjects
- **Choice of majors, including timing (analysis of initial choice in progress)**
- Fields of internships, UROPs, global and other experiences
- Changes of major
- CAP actions
- Add/Drop patterns
- Credit completion, academic probation, withdrawal or transfers
- Grades, including OX, specifically in science core GIR subjects and subjects with science core GIRs as pre-reqs

- **Surveys duplicating aspects of the CUP Study on Undergraduate Majors Selection (3rd such survey closed 5/7)**
- Student satisfaction, climate indicators, etc. from institutional surveys incl. Survey of New Students, Enrolled Student Survey, Student Quality of Life Survey
- **Interviews/focus groups with science core instructors and TAs**
- Additional surveys prepared and implemented by study team
- Interviews with students to understand common thought processes behind their decisions
- Variations based on incoming credit and URM, gender, socioeconomic and first-generation status
- **Opportunity to gather more data based on suggestions as to key concerns/questions to answer**

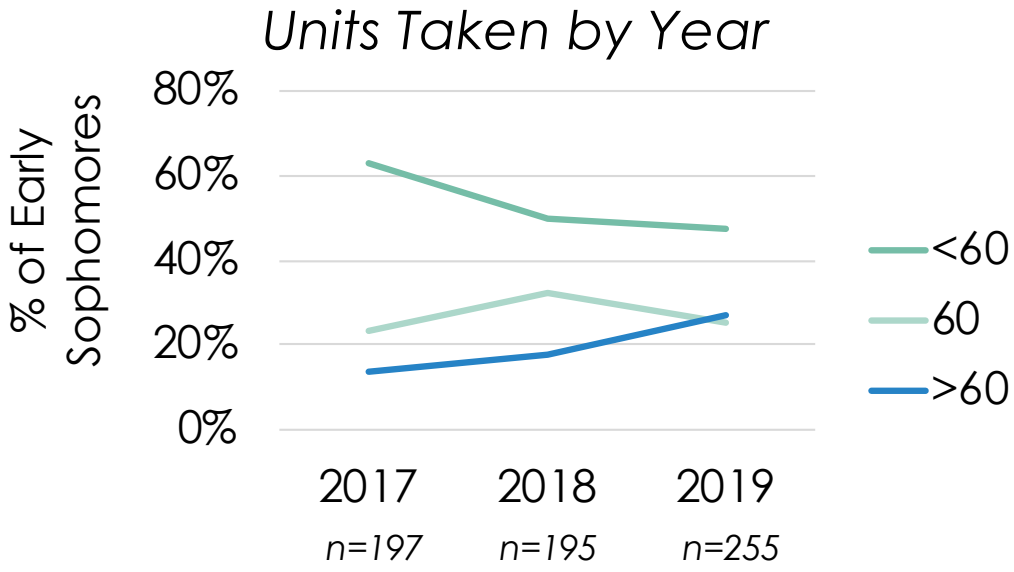
Questions and discussion

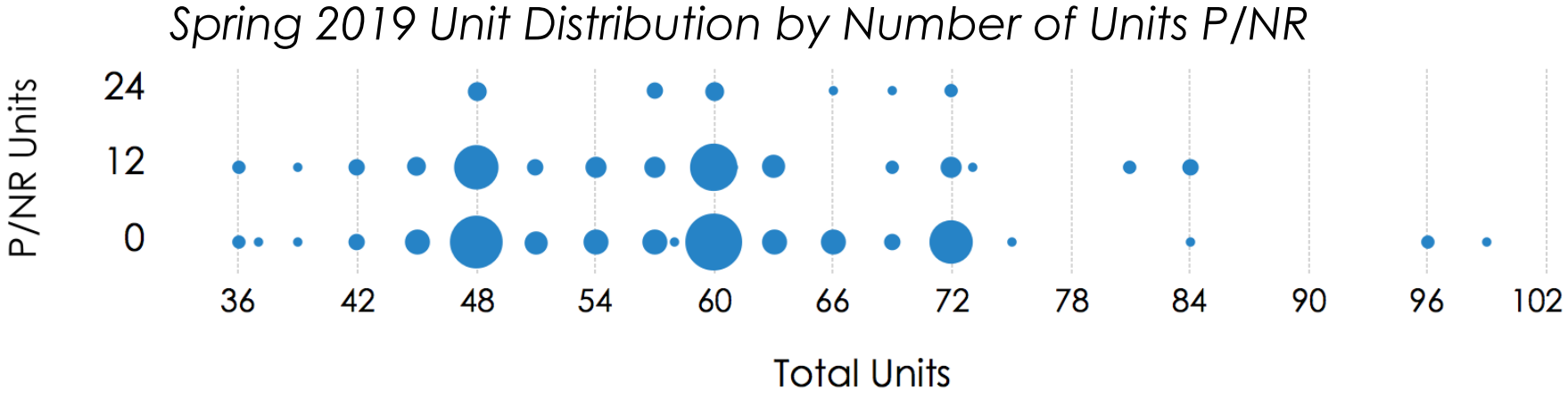
Appendix

Units taken in Spring 2019 – P/NR and Total



Non-Discovery Units Taken by Early Sophomores

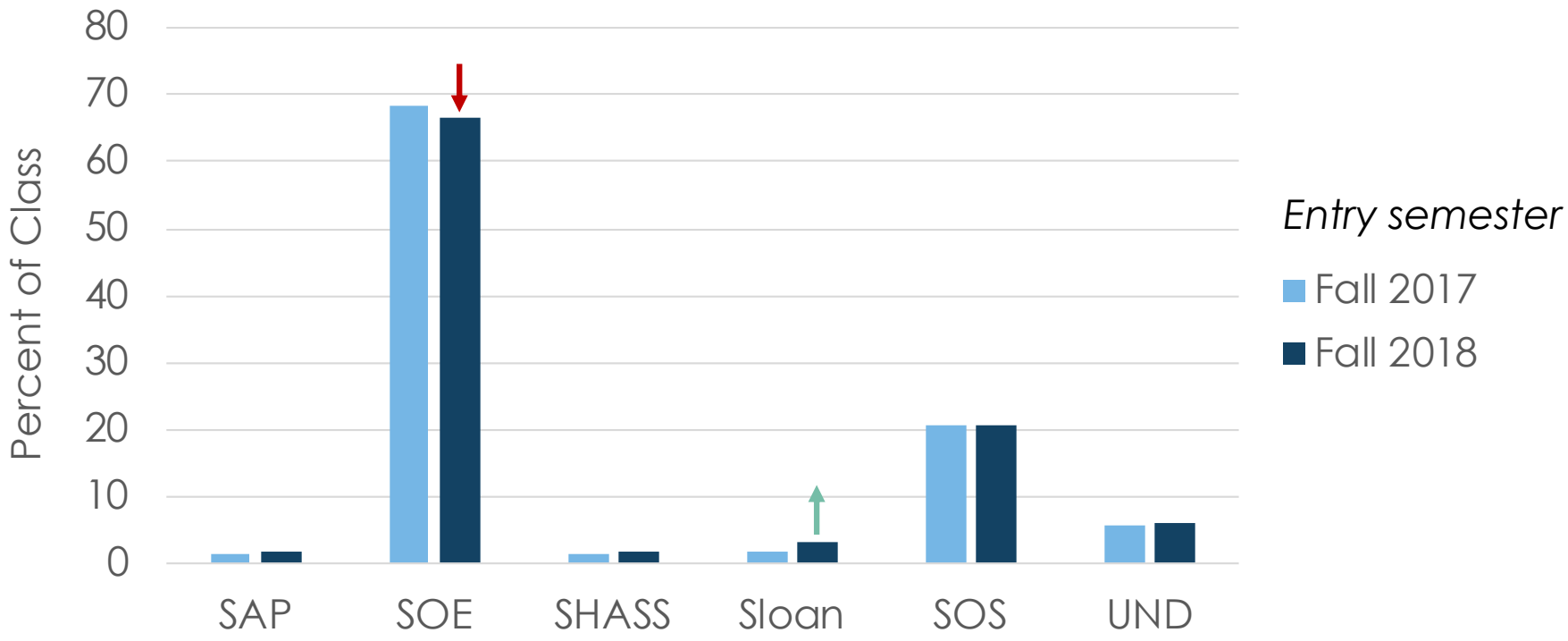




Dot size corresponds to # of students

Major selection – by School

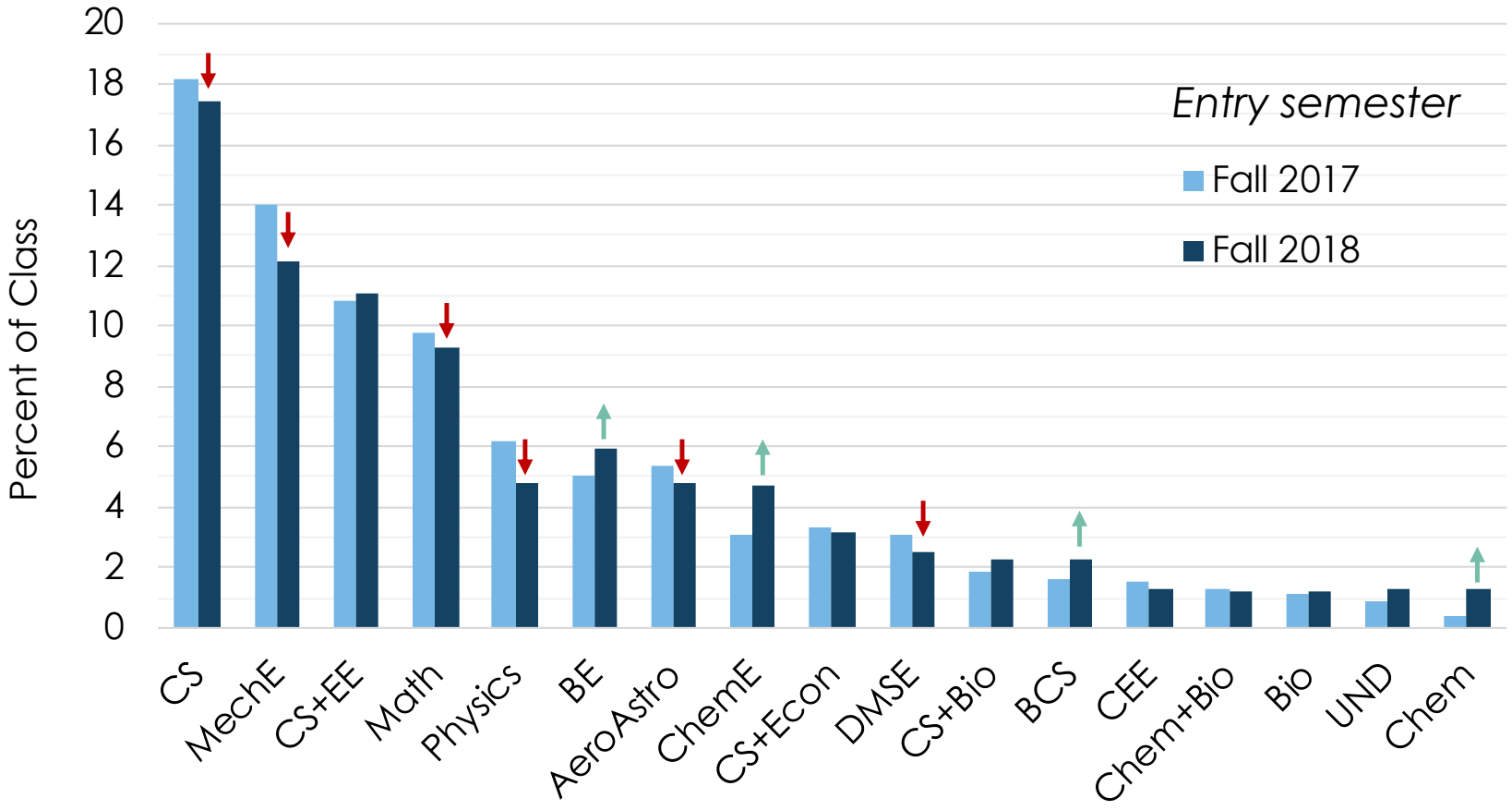
Initial data below, more analysis to come



Arrows indicate change of at least 1%. Enrollment in joint majors included in primary department.

Major selection – by major

Initial data below, more analysis to come



Majors elected by >1% of class entering in Fall 2018 are included. Arrows indicate change of at least 0.5%.

How do students behave along the focused-open spectrum?

	Focused	Focused/ Open	Open	Did not answer survey
% of fall subjects in Application major	14%	14%	9%	13%
% of fall subjects matching Early Sophomore major	23%	27%	19%	30%
# Incoming GIRs (avg)	1.6	1.5	1.2	1.4
# Fall GIRs (avg)	2.1	2.2	2.5	2.1
# Fall exploration subjects (avg)	1.1	1.2	1	1.2
# Spring GIRS (avg as of add date)	1	1	1.2	1
# GIRs remaining after FY (avg, estimated)	1.3	1.3	1.1	1.4

"GIR" above means science core GIR

Why consider experimental alternatives to ESS?

- Provide opportunity for *all* First Year students to access additional advising in a major if they desire it
  - 53% of First Year students said that "Advice I receive from instructors/faculty" is important or very important to their choice of major. *(FYX IAP 2019 Survey)*
- Provide opportunity for up to 60 units to all
- Remove unintended pressure to decide/declare a major at end of IAP as part of ESS process

Many students not prepared to select major‡

- 27% of undergraduate students surveyed did not feel they were prepared to select a major at end of their First Year
- Only 33% strongly agreed that they were well-prepared
- 38% of those who changed majors (who represent 30% of all respondents) indicated that an unsatisfactory experience with intro subjects contributed to their decision to change majors

‡ *2018 Perceptions of Academic Majors survey (**prior to the experiment**)*

Data on Early Sophomore Standing

- Spring 2019: 454 eligible; 255 accepted (Feb. 8)
- Reasons cited by students for accepting ESS:
  - Ability to exceed credit limit
  - Access to advisor in their major
  - Access to Sophomore Exploratory option
- Few students on ESS exceed 60 units:
  - 15% (30 students) in Class of 2020 = 3% of entire class
  - 22% (43 students) in Class of 2021 = 4% of entire class

What % of students are using flexibility to explore within their intended major?

Fall subjects taken in major listed on application (among the whole first-year class)

Fall 2016: 8%

Fall 2017: 9%

Fall 2018: 12%

Fall subjects taken in declared ESS major (among early sophomores, not including undeclared ESS)

Fall 2016: 18%

Fall 2017: 19%

Fall 2018: 25%

6.042/18.062

- Large increase in FA18 enrollment by first year students: +92 compared to FA17
- Statistically significant decrease in overall GPA of the class (all years received lower grades; for example GPA for first-years was the same as that for juniors); no statistically significant change in first-year performance relative to prior years.
- Why students took the subject:

"I wanted to take more course six heavy classes that weren't necessarily the harder classes in terms of course six classes to see if it was actually something that interested me and if it was something that I wanted to continue pursuing."

"I want to pursue maybe Computer Science, and so I wanted to take one course 6 class, just to see how it is. So far it's really different. This class is really, really weird. I didn't expect it to be like that, but it's pretty fun. It's a new way of thinking, which I like."

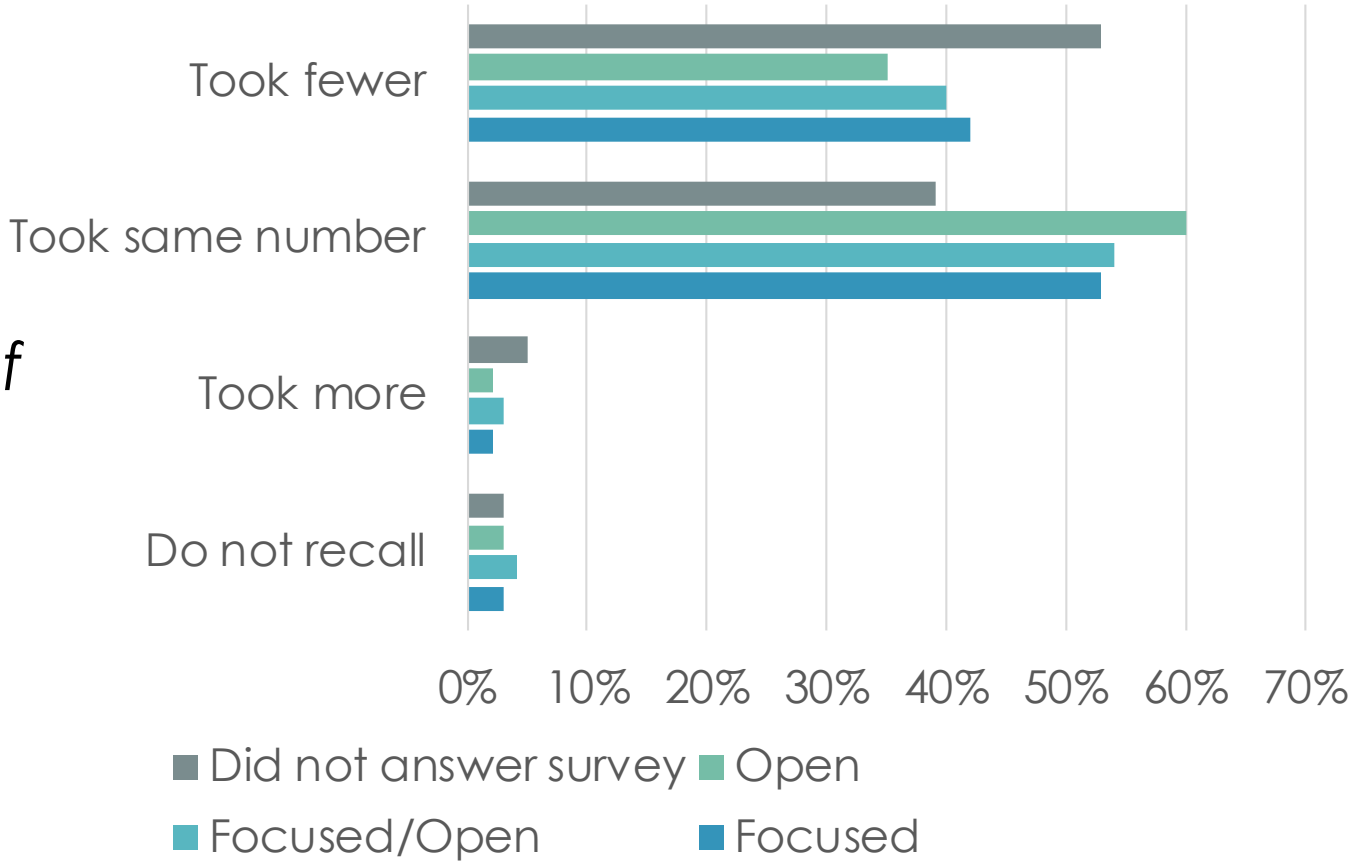
Source: P/NR GIR Experiment, Fall 2018 interviews

Graduate level subjects

- Total number of First Year students completing at least one Graduate level subjects:
  - Fall 2016: 9 first-year students
  - Fall 2017: 15 first-year students
  - Fall 2018: 21 first-year students
- Average First Year student hidden GPA in Graduate level subjects higher this year than in prior two years (students earned almost all A's this year)

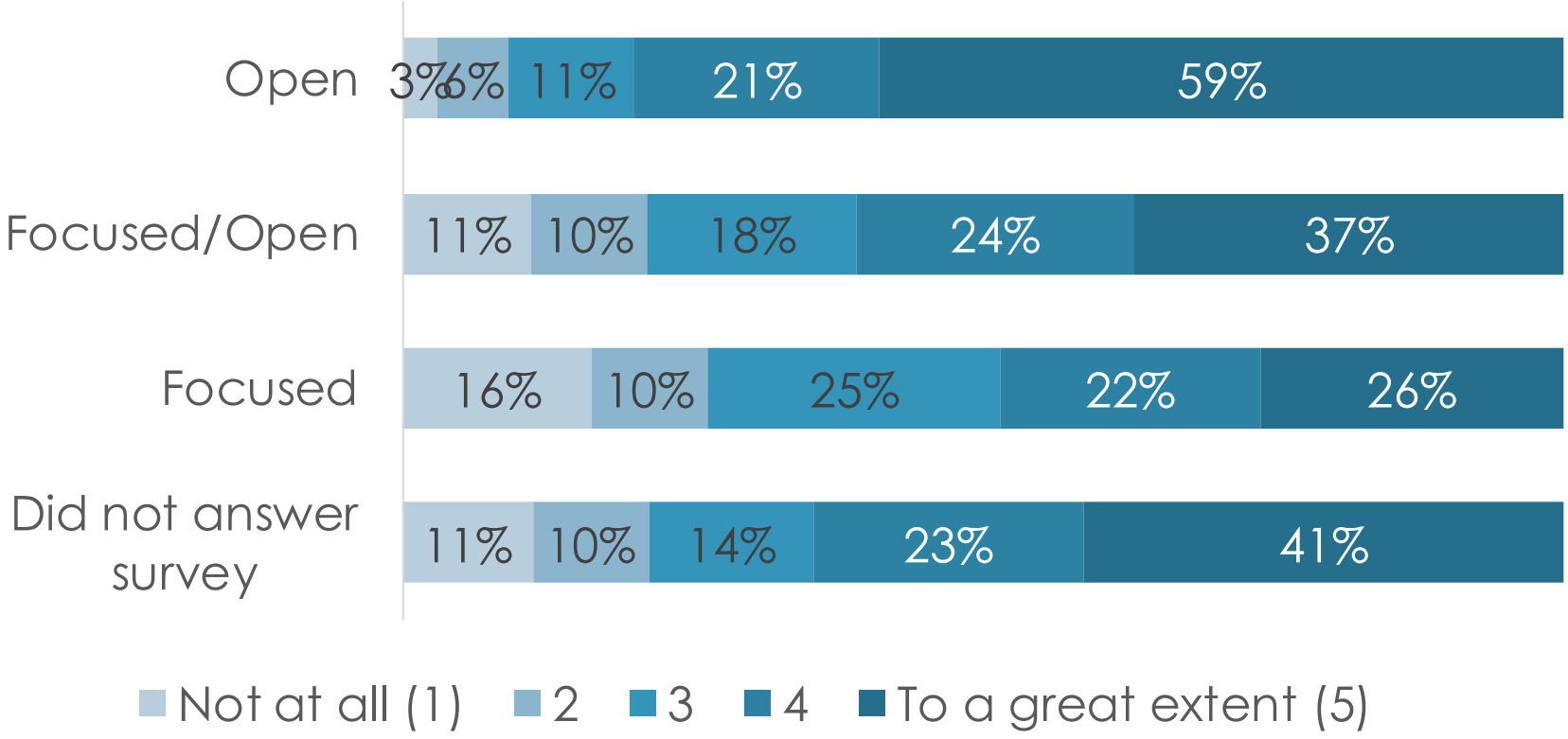
Experiment Policy affects various populations of students differently

How did the experimental P/NR GIR policy affect your choice of how many Science core GIRs to take during the fall semester?



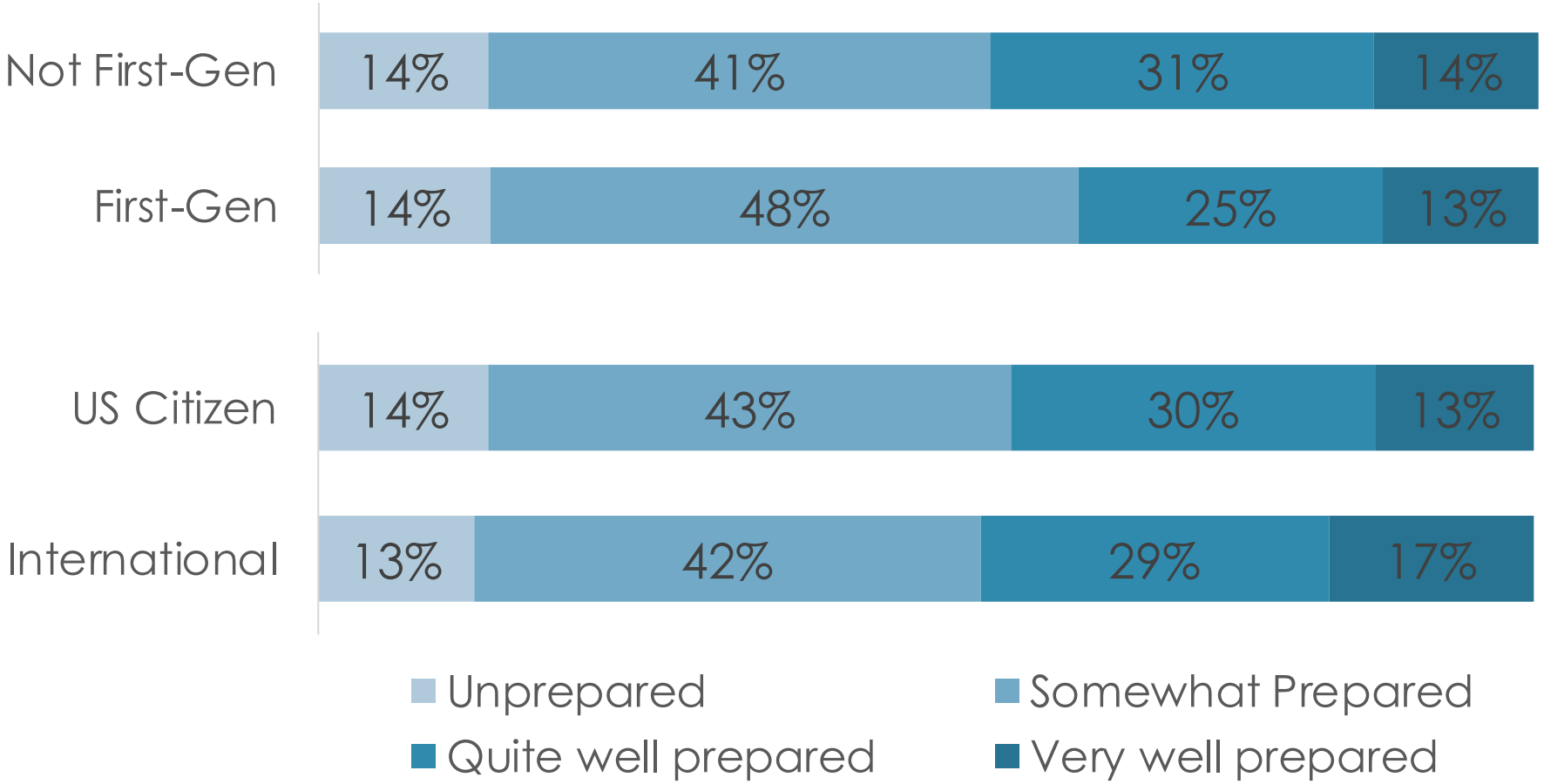
Source: FYX IAP 2019 Survey, categories from SNS 2018
Note: categories do not correlate with First-Gen or International status

"To what extent would the following changes improve the choice of major process for you? A 1-to-3 unit Academic Exploration Subject that doesn't count towards the credit limit."



Source: FYX IAP 2019 Survey, categories from SNS 2018

How well prepared do you feel you are to do the following during your first year at MIT? - "Select the Courses you will take"



Source: Survey of New Students 2018