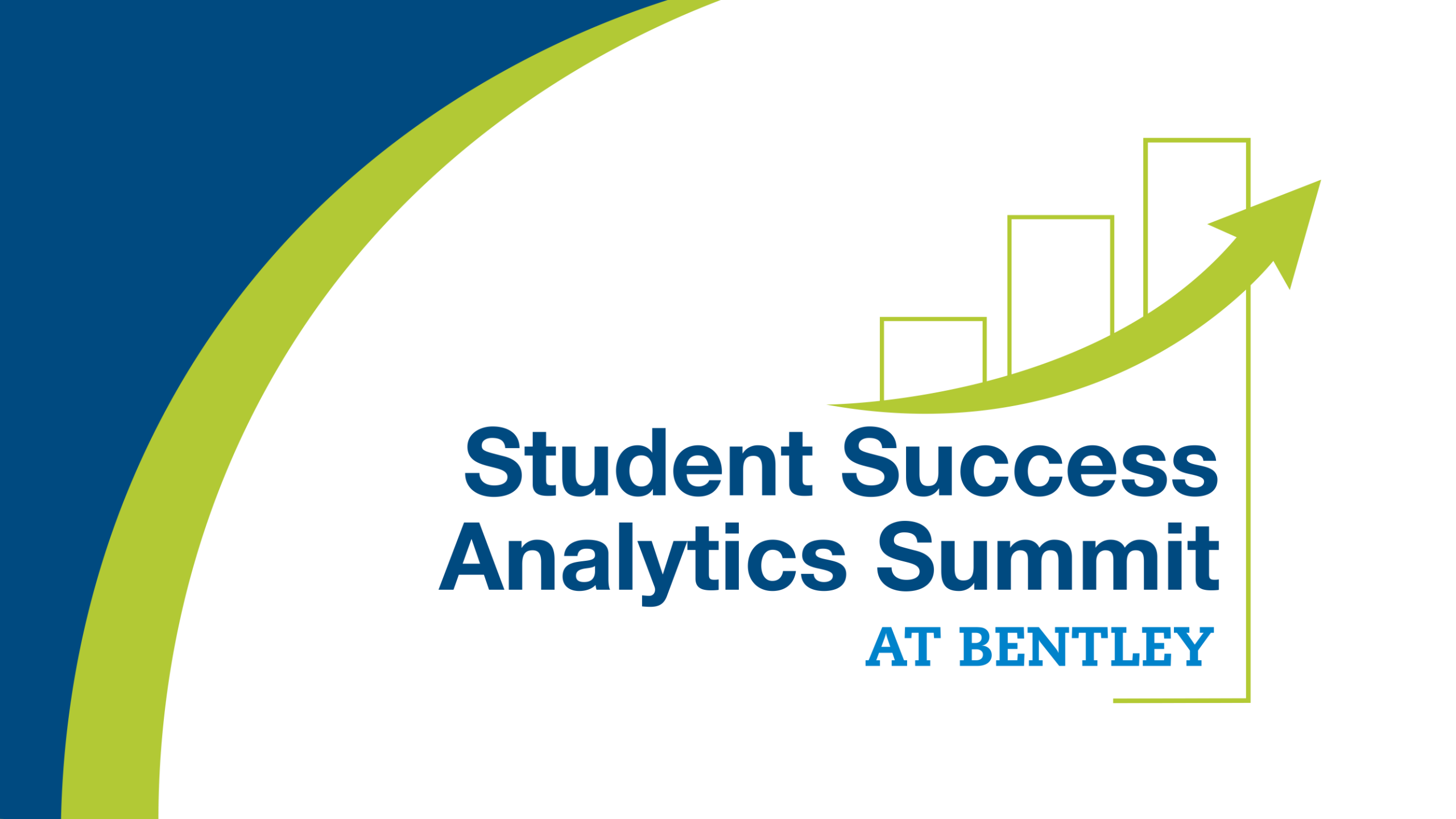




Student Success Analytics Summit

AT BENTLEY

High Impact Academic Intervention to Promote FGLI Academic Performance



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Presenters



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Framing the Problem



Boston College Success Outcomes

- 88% 4-year graduation rate¹
- 91% 6-year graduation rate¹
- 95% retention rate¹
- 87% of graduates employed in class of '25²

¹<https://research.com/best-colleges/boston-college/graduation-rate-and-career>

²<https://sites.google.com/bc.edu/csomcareeradvising/job-outcomes?authuser=0>

Disaggregating Data

- Success measures, such as graduation and retention rates, can be misleading indicators of student success and institutional effectiveness when they are looked at in the aggregate. Authors Banks Tachelle and Jennifer Dohy argue for disaggregating data by race, socioeconomic status, and first-generation status because disparities may exist.¹

¹ Tachelle, B., & Dohy, J. (2019). Mitigating barriers to persistence: A review of efforts to improve retention and graduation rates for students of color in higher education. *Higher Education Studies*, 9(1), 118–131.

<https://doi.org/URL:%20https://doi.org%2010.5539/%20hes.v9n1p118>

BC Success Outcomes

- Who are our students?
- How are they performing at the university?
- How are they performing in the Carroll School of Management?
- What are their career outcomes?
- How does this look when we disaggregate the data?

Building the Model



Crosses Campus Partnerships

- Student Success CRM's (Navigate) – Gender, Race, cumulative GPA's
- Student Services / Registrars office – historical course grades
- Financial Aid Office – student financial-need status
- First-Generation Office – First-Gen student data
- Enrollment Management – App materials: HS type, test scores, etc.

The model ...

A	U	V	W	X	Y	Z	AA	AB	AC
eagle_id	bzannumgrade	Carroll_Scholars	NEED_FLAG	Term	ETHNICITY_NAME	FIRST_GENERATION	APPLICATION_SOURCE	HS_TYPE	Submitted Score
77577388	1.33	0	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown
30398951	2	0	1High	2020FALL	Unknown	1	Unknown	Unknown	Unknown

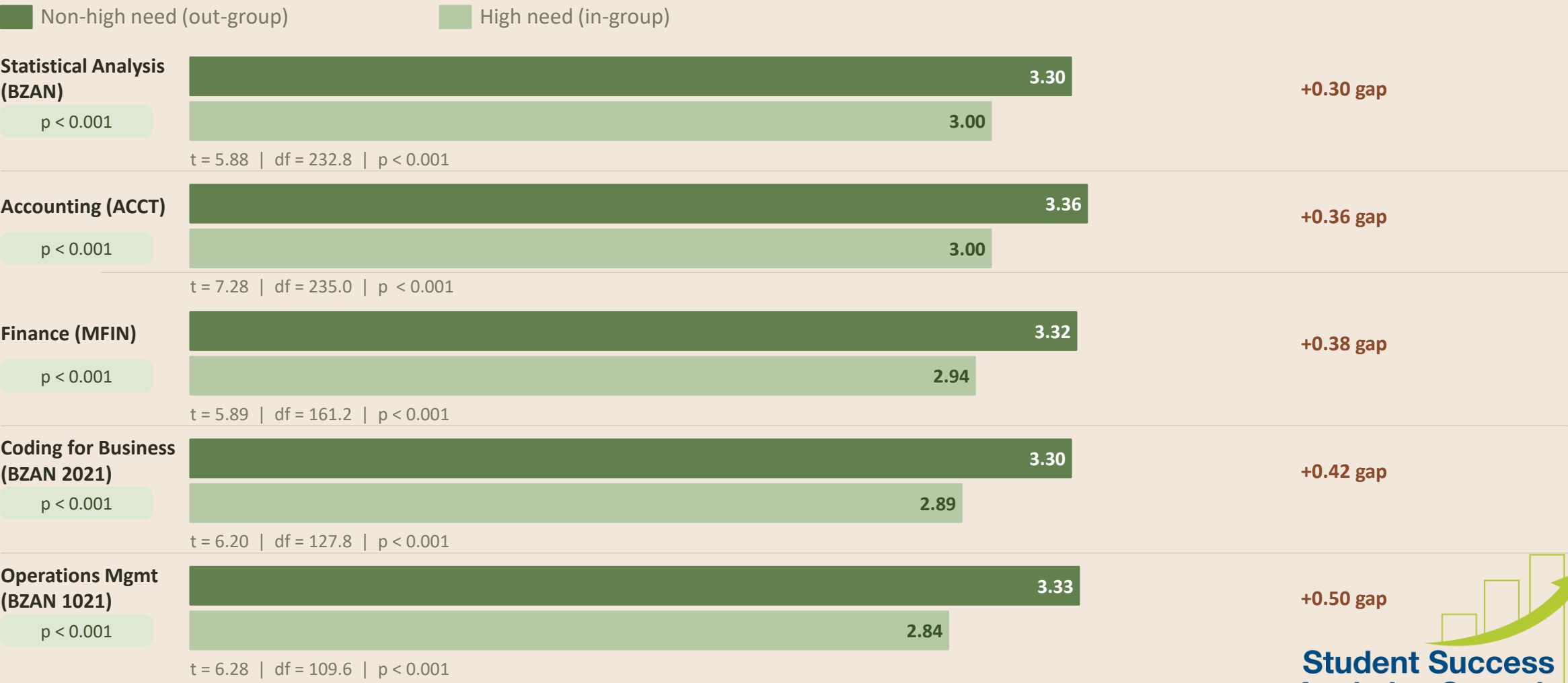
- Eagle ID = unique identifier
- Index(Match())
- V-lookup

Findings



Core Course Grade Gap

High Need vs. Non-High Need Students | Carroll School of Management | Course Data 2022 to 2026



All results from Welch two-sample t-tests. All differences statistically significant ($p < 0.001$). GPA scale 0–4.0.



Career Outcomes Class of '23-'25

High-High Need (Exclude 1st-Gen)

Row Labels	Count of Contact ID	Average of Annual base salary	Average of Guaranteed first-year bonus	%
Full-time employment	40	89,158	8,133	40%
No response	37			37%
Seeking employment	16			16%
Continuing education	3			3%
Seeking continuing education	3			3%
Part-time employment	1			1%
Grand Total	100	89,158	8,133	

1st Gen & High-High Need

Row Labels	Count of Contact ID	Average of Annual base salary	Average of Guaranteed first-year bonus	%
Full-time employment	21	91,786	8,667	44%
No response	15			31%
Seeking employment	9			19%
Seeking continuing education	2			4%
Part-time employment	1			2%
Grand Total	48	91,786	8,667	

No Need

Row Labels	Count of Contact ID	Average of Annual base salary	Average of Guaranteed first-year bonus	%
Full-time employment	842	87,720	9,576	58%
No response	473			33%
Seeking employment	74			5%
Continuing education	31			2%
Seeking continuing education	9			1%
Military service	5			0%
Part-time employment	5			0%
Not seeking	3			0%
Volunteer service	3			0%
Grand Total	1445	87,720	9,576	

Commentary

- High-need Montserrat students have a higher rate of seeking employment graduating from Boston College versus there no-need counterparts (16% vs 5%)
- High-need and First-Generation Montserrat students have a higher rate of seeking employment graduating from Boston college versus there no-need counterparts (19% vs 5%)

Developing the Carroll Scholars Learning Community (CSLC)



Carroll Scholars Learning Community

- Deliver comprehensive support services to students from interconnected institutional agents over a four-year period of time¹
- Institutional Responsibility for creating a supportive, strengths focused environment to help all our students succeed²

¹ <https://www.bc.edu/bc-web/sites/bc-news/articles/2024/fall/csom-program-fosters-community-for-first-gen-students.html>

² <https://www.bc.edu/bc-web/schools/carroll-school/news/2023/a-place-for-us.html>

Carroll Scholars Learning Community Student Journey Map

	Pre-Freshman Summer	Freshman Year		Sophomore Year			Junior Year			Senior Year	
	Summer	Fall	Spring	Summer	Fall	Spring	Summer	Fall	Spring	Fall	Spring
Academic		- Statistical Analysis - Statistics Seminar - Career Bridge (Wed)	- Accounting - Accounting Seminar - Career Accelerator (Wed)		- Finance - Finance Seminar	- Coding for Business - Coding Seminar		- Operations - Ops. Seminar			Personal Finance Seminar
Program Advising		- Oral Exam (mid-term) - Oral Exam (final)	- End of Year Plan - Resume Review	Interview Prep Workshop (July)	- Academic Goals & Career Outlook (Fin. Service + Cons.) - Eagle Fellowship Workshop	Eagle Fellowship Workshop		Internship Support Meeting	Internship Support Meeting		
Community		- Fall community outings - Bridge Builders (B.B.) mentees	- Spring community outings - B.B. Mentees - Career Treks (NYC & Bos)		- B.B. Mentorship - Fall community outings	- B.B. Mentorship - Spring Community Outings - Community Service		- B.B. Mentorship - Fall Community Outings	- B.B. Mentorship - Spring Community Outings	- B.B. Mentorship - Fall Community Outings	- B.B. Mentorship - Spring Community Outings
Other Offices	PMI: BC F1rst & OTE	CSOM: SHEA F.I.P., Corcoran Case Comp. FYE (M&M): 48Hours SA: Res.: LLC BC F1rst Seminar OSI: Invol. Fair	CSOM: Jenks LP FYE (M&M): Freshman League & Ascend, 48Hours PMI: McNair Scholar	CSOM: Semester Abroad, M&M: Monts.: Jamaica Magis, OL	CSOM: Acad. + Car. Advising, Corc. Case Comp. PMI: McNair Scholar M&M: Retreats: Kairos CSF: Halftime, Stride	CSOM: Acad. + Car. Advising, Jenks LP CSF: Halftime M&M: Retreats: Kairos	CSOM: Intern Fund M&M: OL	CSOM: Acad. + Car. Advising, Corc. Case Comp. CSF: Halftime M&M: Retreats: Kairos	CSOM: Acad. + Car. Advising, Jenks LP CSF: Halftime M&M: Retreats: Kairos	CSOM: Acad. + Car. Advising, Jenks LP CSF: Halftime M&M: Retreats: Kairos	CSOM: Acad. + Car. Advising, Jenks LP CSF: Halftime M&M: Retreats: Kairos

CSLC Academic Seminars



Academic Seminars Design

- Academic success drives professional readiness, but:
 - Lower sense of belonging in the classroom
 - Courses are challenging and ramp up quickly
 - Academic foundations are varied – content, rigor, and process
 - Lack of exposure to future professions
- Seminars in historically challenging, pre-professional courses
 - Statistical Analysis
 - Coding for Business
 - Financial Accounting
 - Finance
 - Operations Management
- Students seeded across all sections of one professor's course

Seminar: Statistical Analysis & Data Management

- Parallel to core statistical analysis course
- Seminar focus on
 - problem solving
 - critical thinking
 - data fluency
 - statistical literacy
 - analytical thinking
- But also...
 - Professional formation
 - Cohort engagement

**Common across all
academic seminars**

Initializing the Seminar

- Statistical Knowledge and Readiness
 - Comprehensive Assessment of Outcomes in Statistics (CAOS)
 - Statistics Anxiety Rating Scale (STAR)
- Student introduction and self-assessment
 - Brief inventory of ***background in, interest in, and concerns about*** statistics
 - General student introduction: Why BC, excited about, apprehensive about, what do you want me to know about you?

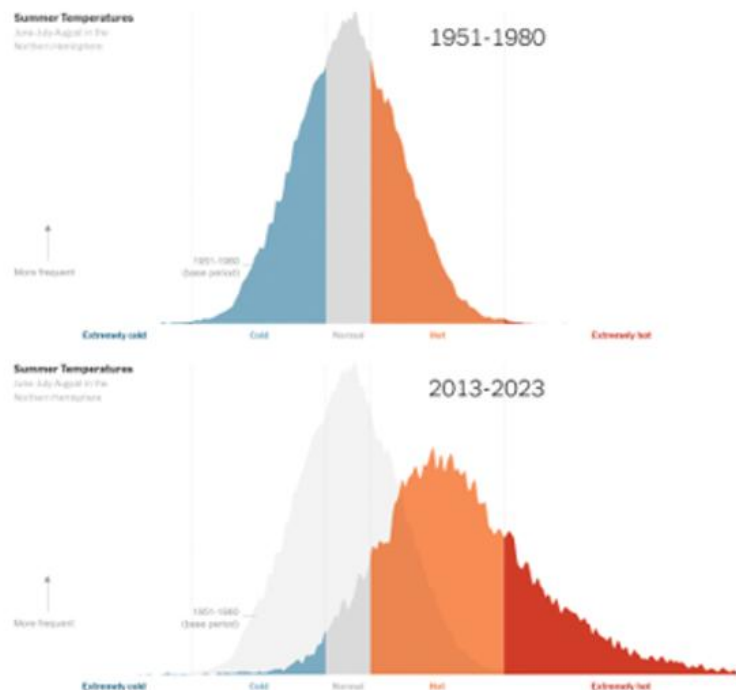
Weekly Seminar: Critical Thinking

- **Critical Thinking Activity**

- "What's Going on in this Graph?"
- Conversation starter connected to current course concepts
- Think – pair – share
- Propose a new visualization
- ***Responsive to CAOS insights and seminar learning goals***

For Example ...

What's going on here?



What do you notice?

What question(s) comes to mind?

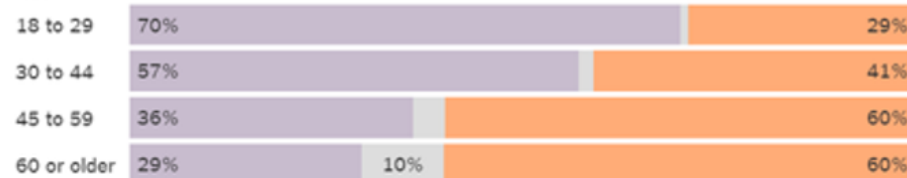
Write a sentence that uses what you know to describe what we are seeing in this graph.

What's going on here?

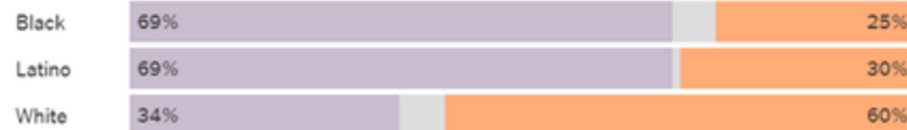
Do you think colleges should pay their athletes?

Yes No Unsure

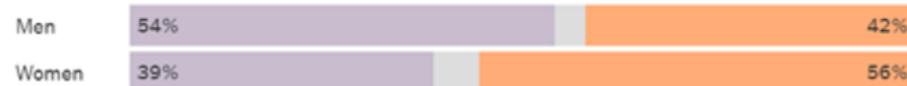
Age



Race/Ethnicity



Gender



Note: Figures may not add up to 100 percent because of rounding. - Based on a Marist poll of 1,264 adults in the United States from Feb. 15 to Feb. 21. - By The New York Times

What do you notice?

What question(s) comes to mind?

What do you think this means for you/classmates in the college experience?

Weekly Seminar: Data Fluency & Statistical Literacy

- Data wrangling extensions and expansions
- Use "messy" data to revisit and dive more deeply into current course topic
- Grapple with selecting techniques to manage data and conduct analysis to answer questions

For example: correlation and regression

- What are the connections between correlation and regression?
- Let's look at all heights variables from our class data set ...
- Think about tidying up that data as needed
- To predict a person's height, is it more useful to know mother height or father height?

```
> favstats(~hgtinches, data = survey1135)
min Q1 median Q3 max      mean      sd    n missing
51 65      69 71 744 70.45335 38.43624 313      3
> favstats(~mhgtinches, data = survey1135)
min Q1 median Q3 max      mean      sd    n missing
52 62      64 67  74 64.28767  3.420929 300     16
> favstats(~fhgtinches, data = survey1135)
min Q1 median Q3 max      mean      sd    n missing
0 68      70 72 510 71.9391 37.03047 299     17
```

Data needs tidying (note min/max)
Missing pairs in correlation command (note n)
Changes of sample size in models

For example: building connections

- **Football playmaking**

- Probability of making an extra point kick is 94%
- Probability of making a two-point conversion is 48%
- What analysis helps you explain why you see a lot more kick attempts than you see two-point conversions ... use the actual numbers!
- Write a sentence using your analysis to explain ...

discrete
probability
distribution

- **Imagine a WILD game, kicker gets 10 extra points attempts!**

- What is the probability that they make exactly 7 of the extra point kicks?
- What is the probability they make all 10?
- What is the probability they miss less than 6?

same
probability
measures,
binomial

binomial using probability complement

Weekly Seminar: Problem Solving

- University homework problem sets are daunting to the uninitiated!
- Each session wraps up with an in-depth dive of an exemplar problem from each main topic of the week
- Worked in concert as a group, we discuss & practice:
 - Breaking problems down into piece parts
 - Using class notes / programming cheat sheet as resources
 - Struggling thru ambiguity

Seminar Activities: Analytical Thinking

Professional Perspective

- Encourage engagement with Business Analytics Academy
- Encourage engagement with TAs for internship ideation
- Guest speaker: career story arc

"Think like an Analyst"

- Pull in current news items and consider the data behind them
- Focused visualization project

Assessing Impact



Carroll Scholars Impact

We examined whether participation in the Carroll Scholars Learning Community (CSLC) is associated with stronger academic performance among high-need students, focusing on four core quantitative business course: Coding for Business, Finance, Financial Accounting, and Statistics. CSLC Students were compared to other high-need students from the class of 2026 through 2029 who were not enrolled in the program, using course GPAs on a 4.0 scale.

CSLC students earned higher average GPAs than their high-need peers in Statistics, Financial Accounting, and Finance. There was no marginal difference between Coding for Business and Economics grade comparisons.

Overall, these results show a consistent pattern: CSLC students perform better in quantitative courses with additional support than their comparable students outside the program. CSLC is a high-impact academic intervention.



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Appendix A: Statistical Methods and Detail Results

Analytical Approach

To examine differences in academic performance between high-need students enrolled in the Carroll Scholars Learning Community (CSLC) and comparable high-need students not enrolled, we conducted Welch Two-Sample t-tests for each course. Course performance was measured using final course GPA on a 4.0 scale.

Course	Non-Scholar Avg.	Carroll Scholar Avg.	Difference	Significant?
Finance	2.89	3.35	+0.47	Yes ($p < .001$)
Accounting	2.93	3.28	+0.34	Yes ($p < .001$)
Statistics	2.96	3.18	+0.22	Yes ($p = .041$)
Coding for Business	2.89	2.86	-0.03	No ($p = .893$)
Economics	3.25	3.29	+0.04	No ($p = .745$)

Interpretation and Limitations

In Economics, a non-intervention course where CSLC students receive no targeted academic support, the performance difference between CSLC and non-CSLC students was smaller and non-significant (0.04 GPA points, $p = .745$). This contrasts with the larger, statistically significant differences observed in intervention courses such as Accounting, Finance, and Statistics. The lack of a significant effect in a control course where no intervention occurs strengthens the inference that CSLC's targeted academic support, rather than pre-existing student characteristics alone, drives the observed performance gains in quantitative business courses.



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Questions?

