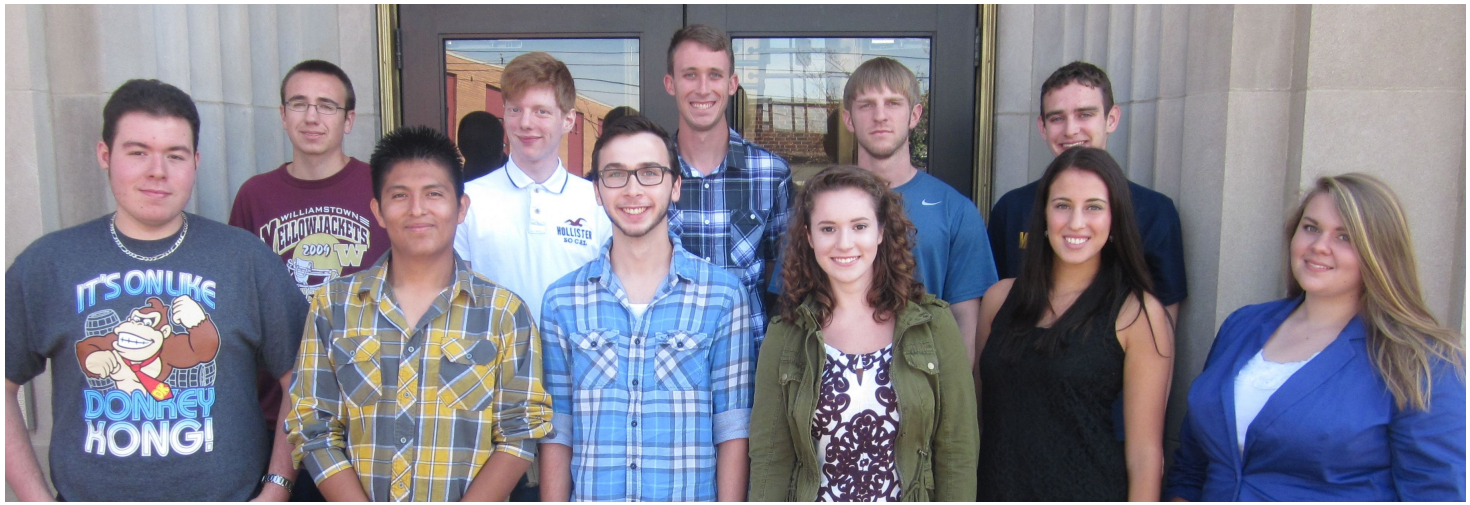
Learning Assistants in Introductory Physics:

Successes and Challenges at WVU

Paul M. Miller
WVU Physics and Astronomy
@pmmiller8

WVU LA Program

- Baseline data: Spring 2011. LAs began in fall of 2011 (1st semester); fall of 2012 (2nd semester)
- "Side project" on larger grant: well-suited to replication.
- Based on LA program at the University of Colorado (I recommend their annual LA workshop.)
- LAs support UW tutorials, implemented during weekly lab sections.
- All LAs are enrolled in a science-focused pedagogy course.
- We pre- and post-test for content learning gains (from the FMCE and CSEM) and attitudes (from the CLASS) data.
- Goals: increased student learning and more students in the secondary-teaching pipeline



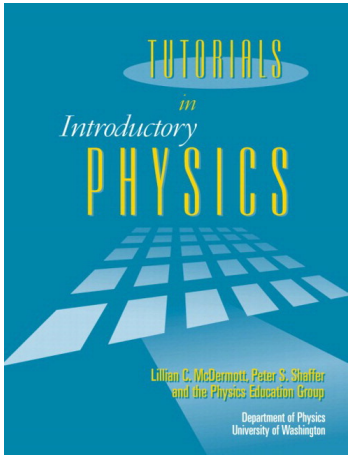
Gains trends up, but Fall ≠ Spring

Course/Semester	Normalized Gain
Physics 111/Spring 11	0.27 (Baseline)
Physics 111/Fall 11	0.15 (1st LA semester)*
Physics 111/Spring 12	0.47
Physics 111/Fall 12	0.28
Physics 111/Spring 13	0.49
Physics 111/Fall 13	0.31
Physics 111/Spring 14	0.44

*This result included instructors who were not integrated into the LA program due to a last minute schedule change.

(Compare to average traditional 0.15±0.03 and research-based 0.63±0.06, Thornton, *et al*. 2009.*)*

If real, to what do we credit the gains?

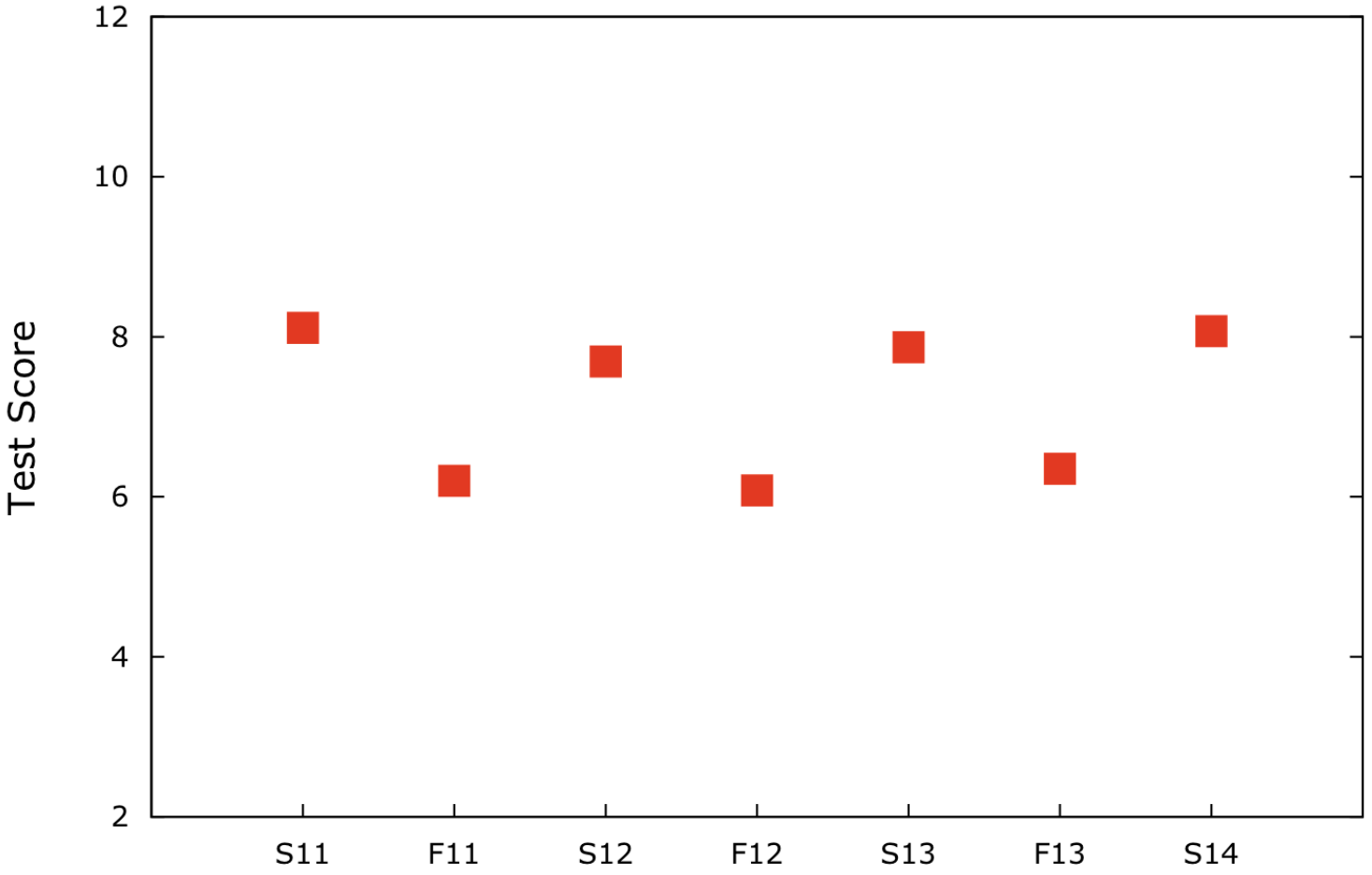


The first thing we noticed

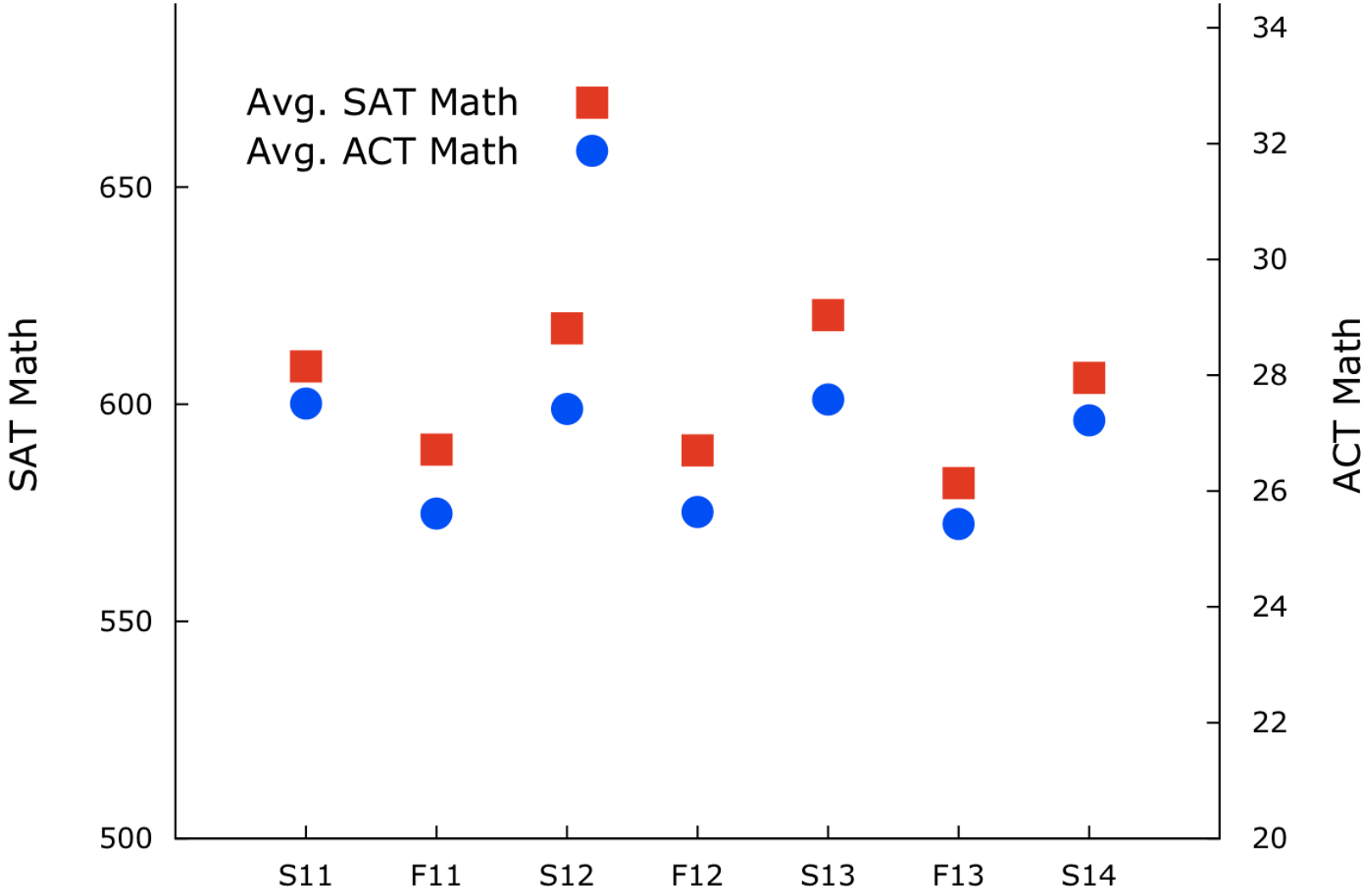
Course/Semester	Normalized Gain
Physics 112/Spring 11	0.13 (Baseline)
Physics 112/Fall 11	0.17(Baseline)
Physics 112/Spring 12	0.087(Baseline)
Physics 112/Fall 12	0.22(1st LA semester)
Physics 112/Spring 13	0.14
Physics 112/Fall 13	0.28
Physics 112/Spring 14	0.17

(Compare to 0.23, Maloney, et al. 2001.)

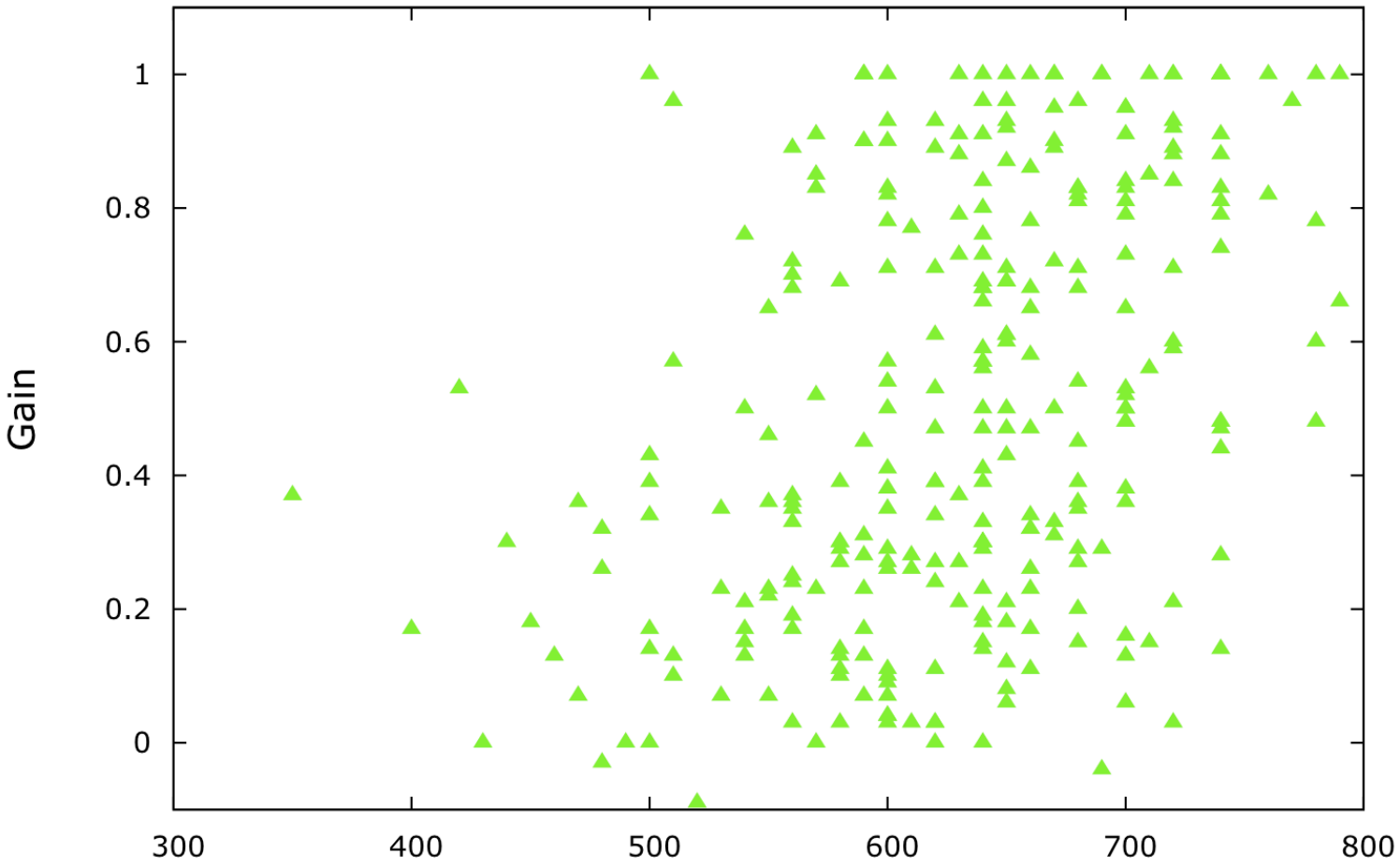
Characterizing the population



Characterizing the population



No fall baseline! Does it work?



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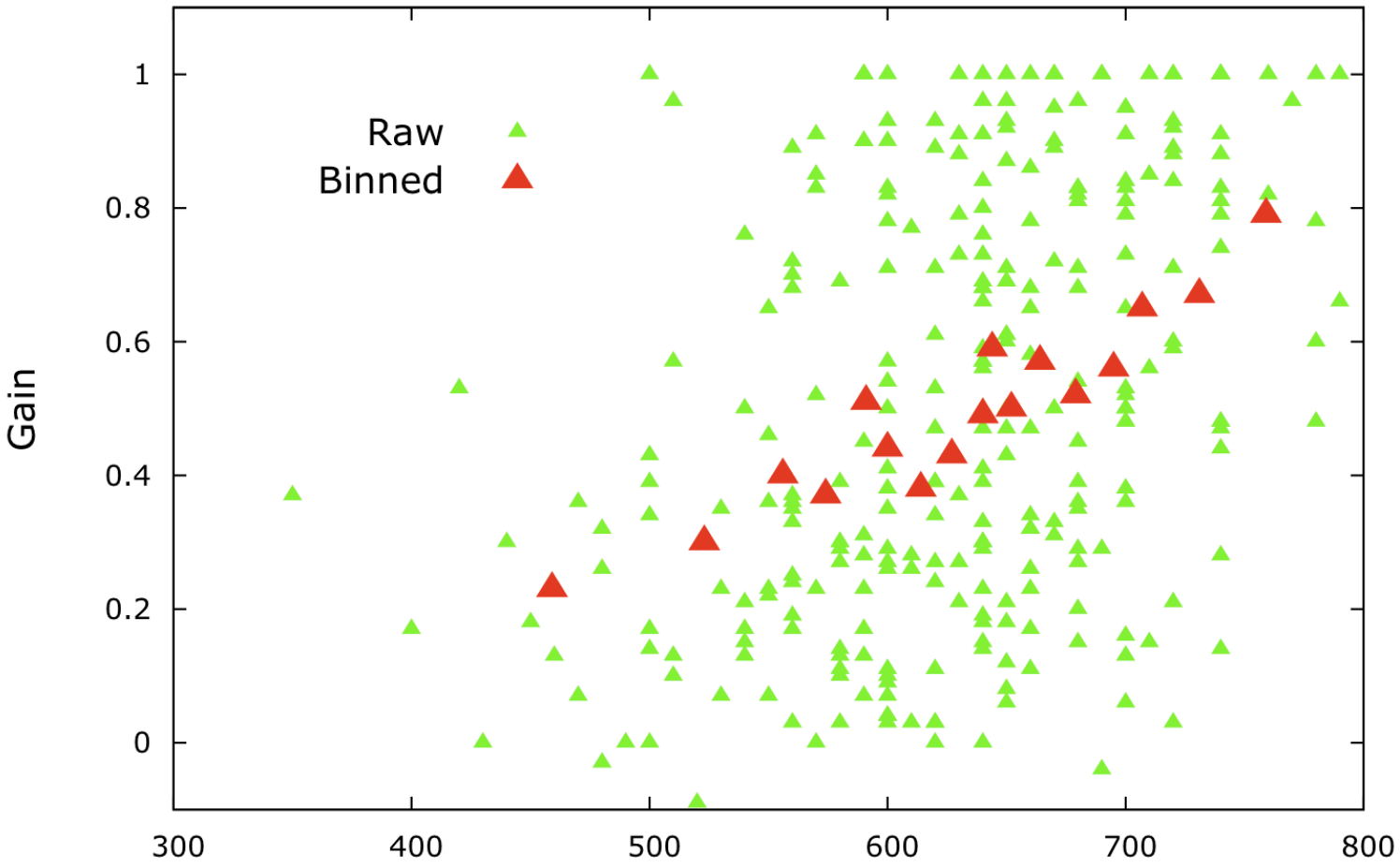

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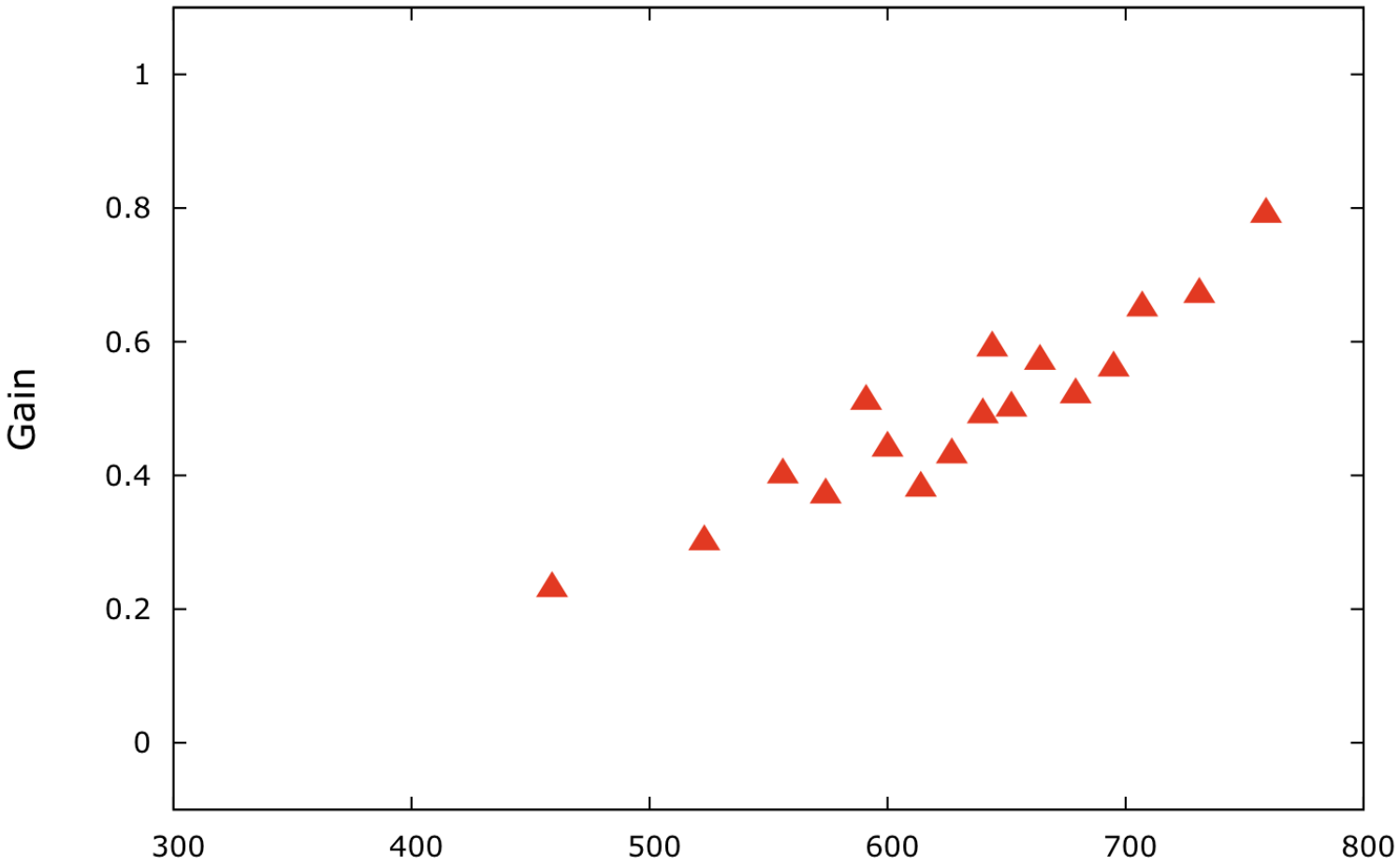

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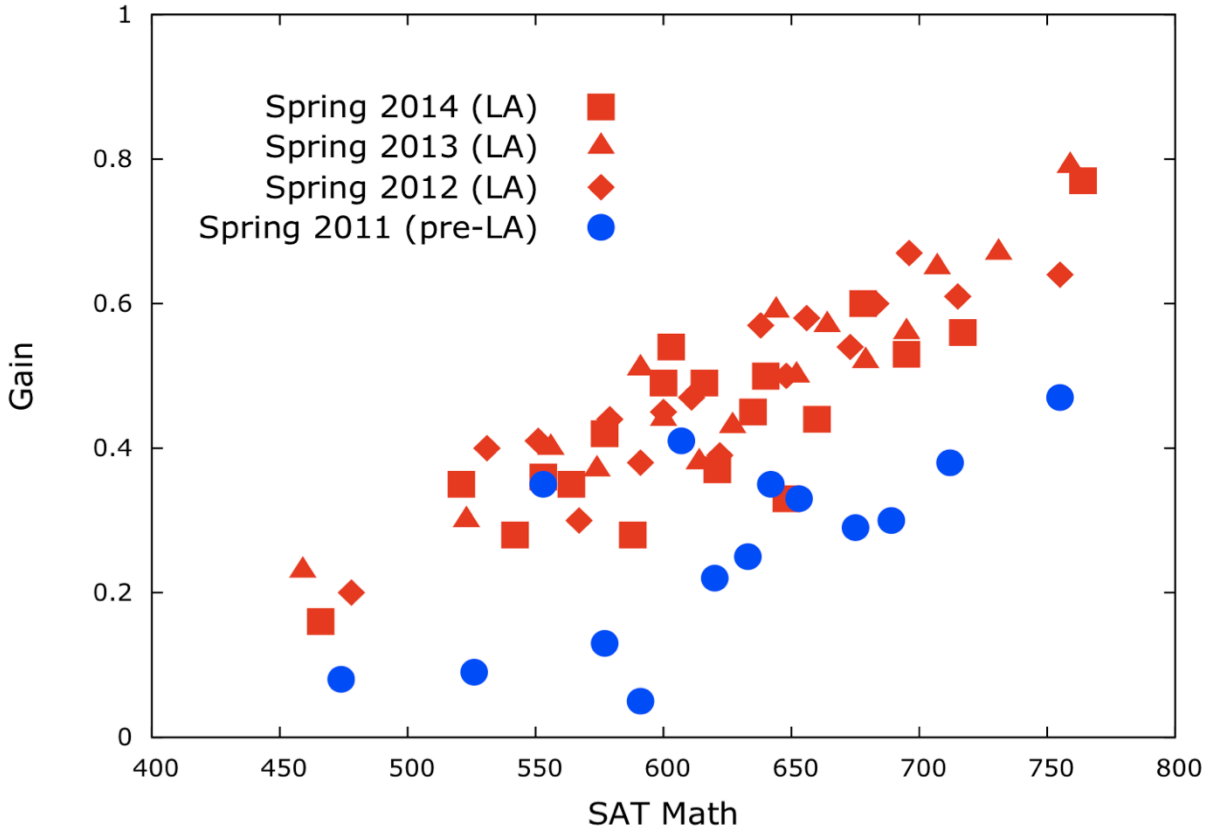
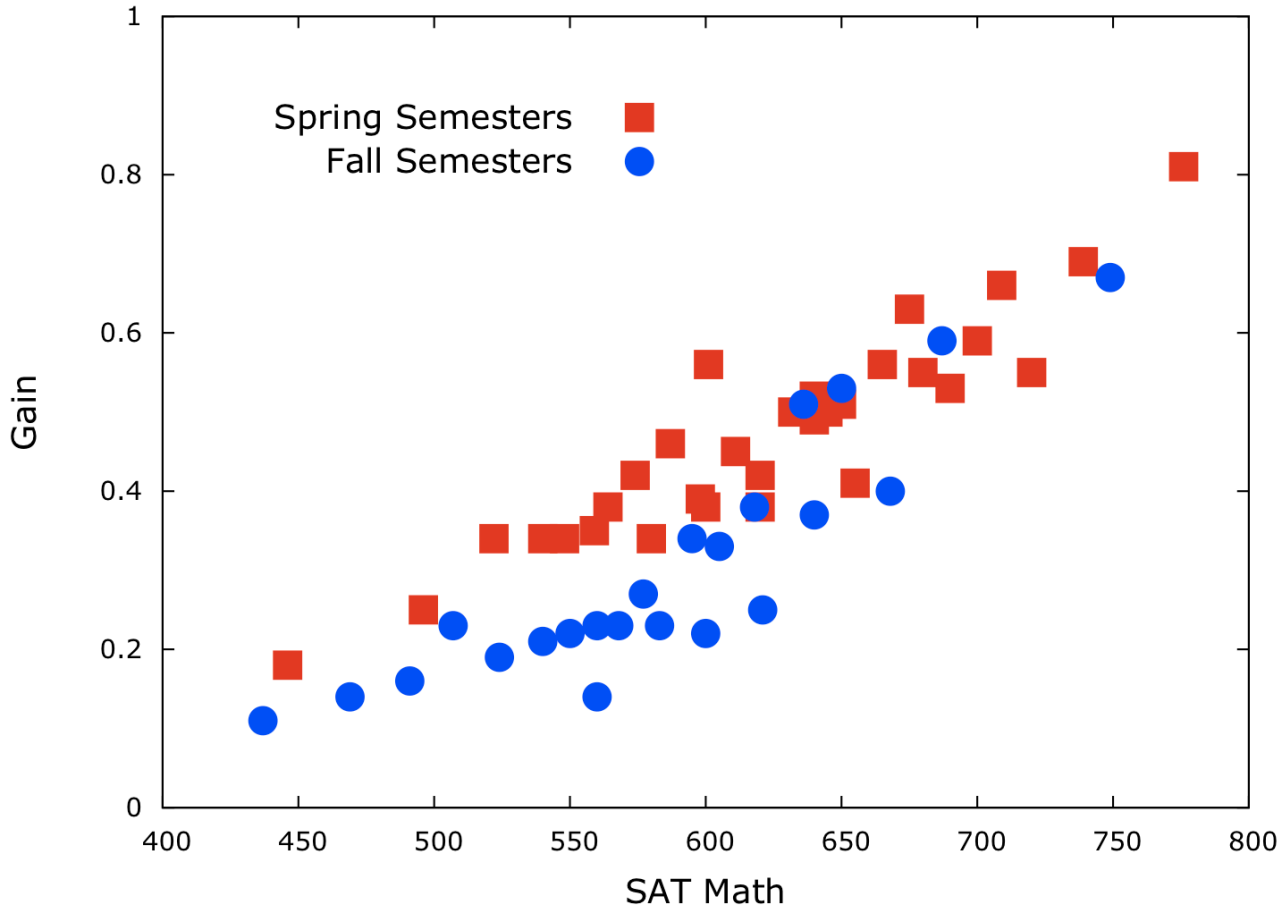
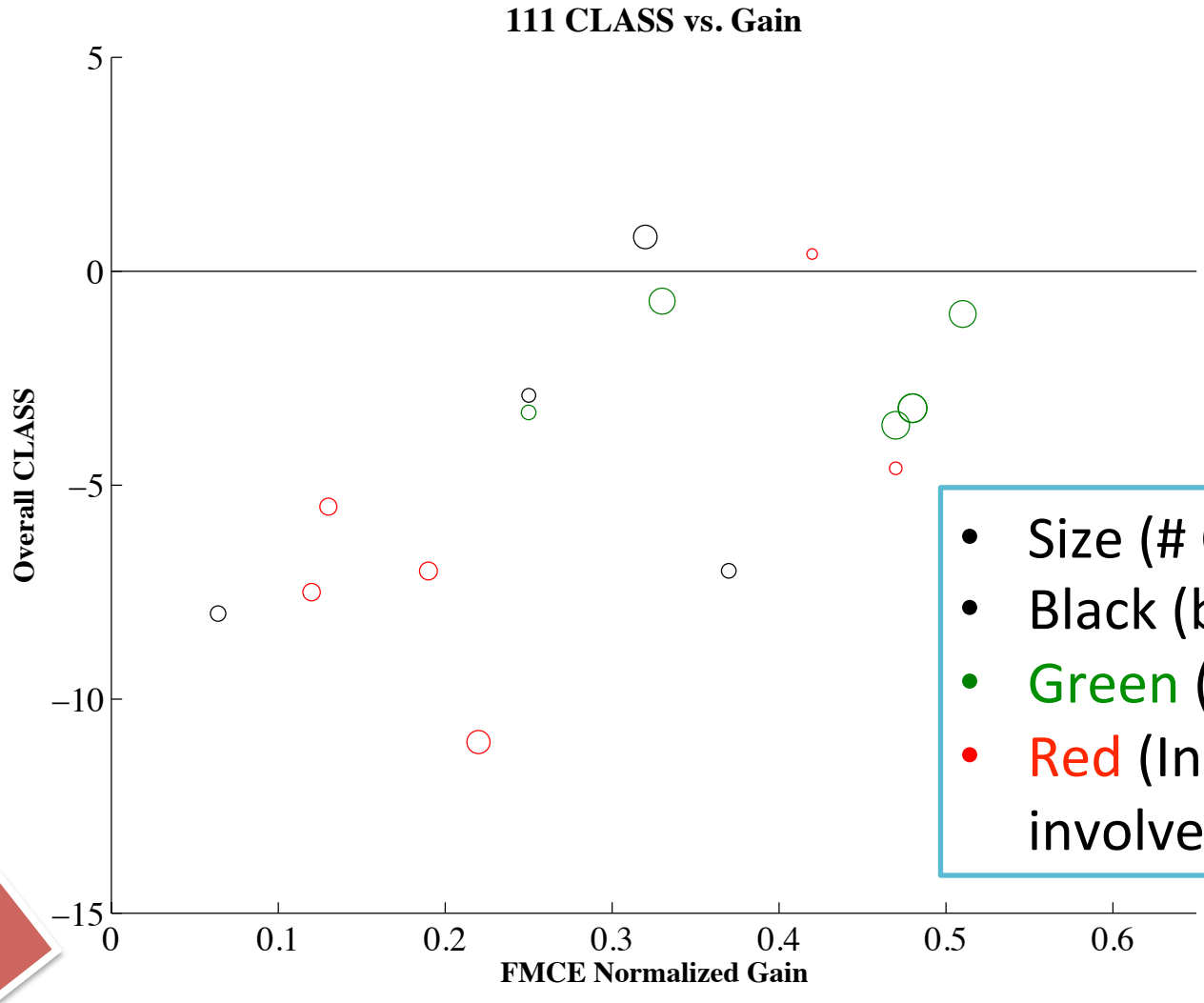


LA-supported sections 2012-14



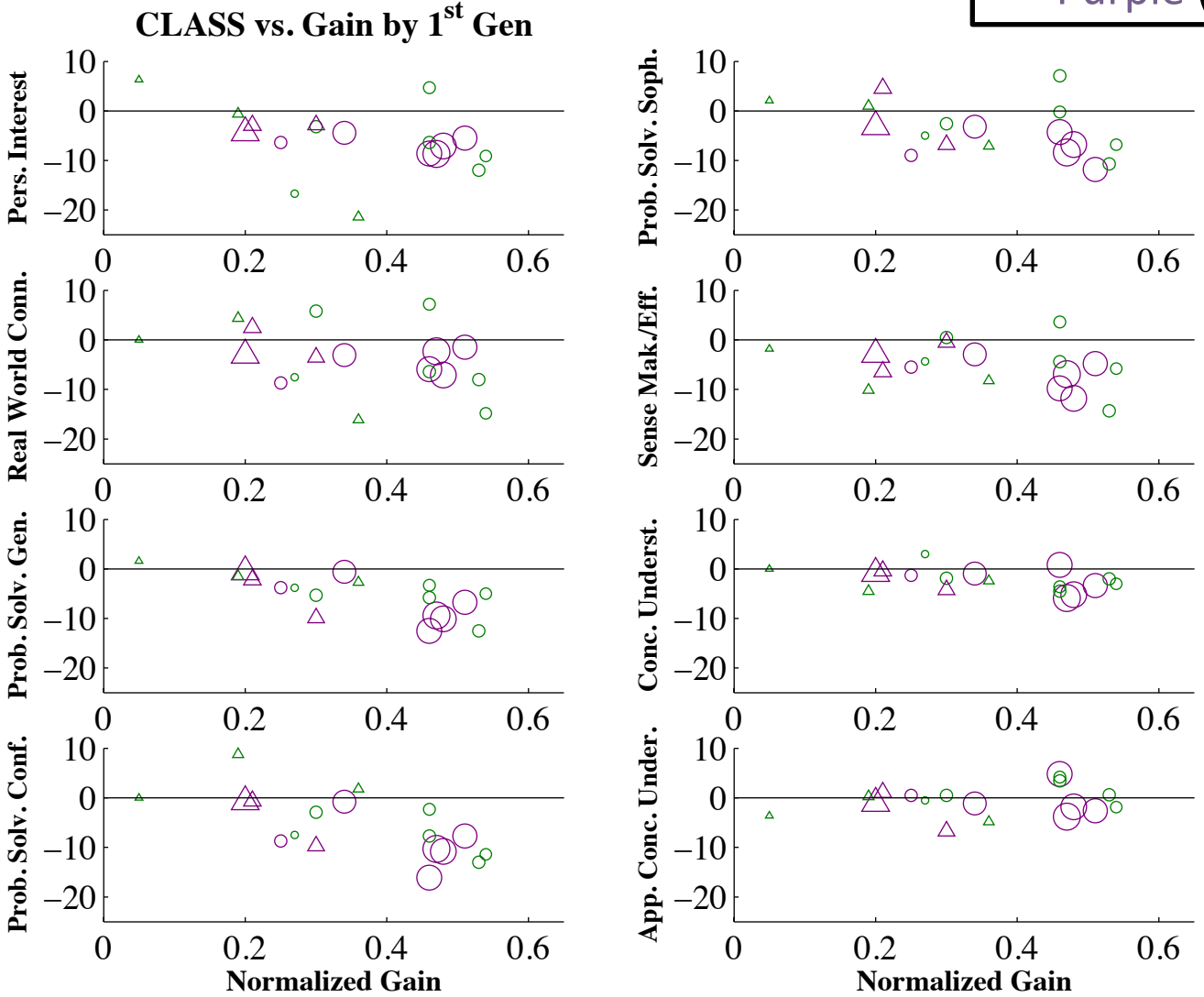
CLASS vs. gain, by section



- Size (# CLASS pairs)
- Black (baseline)
- Green (LA)
- Red (Instructor not involved)

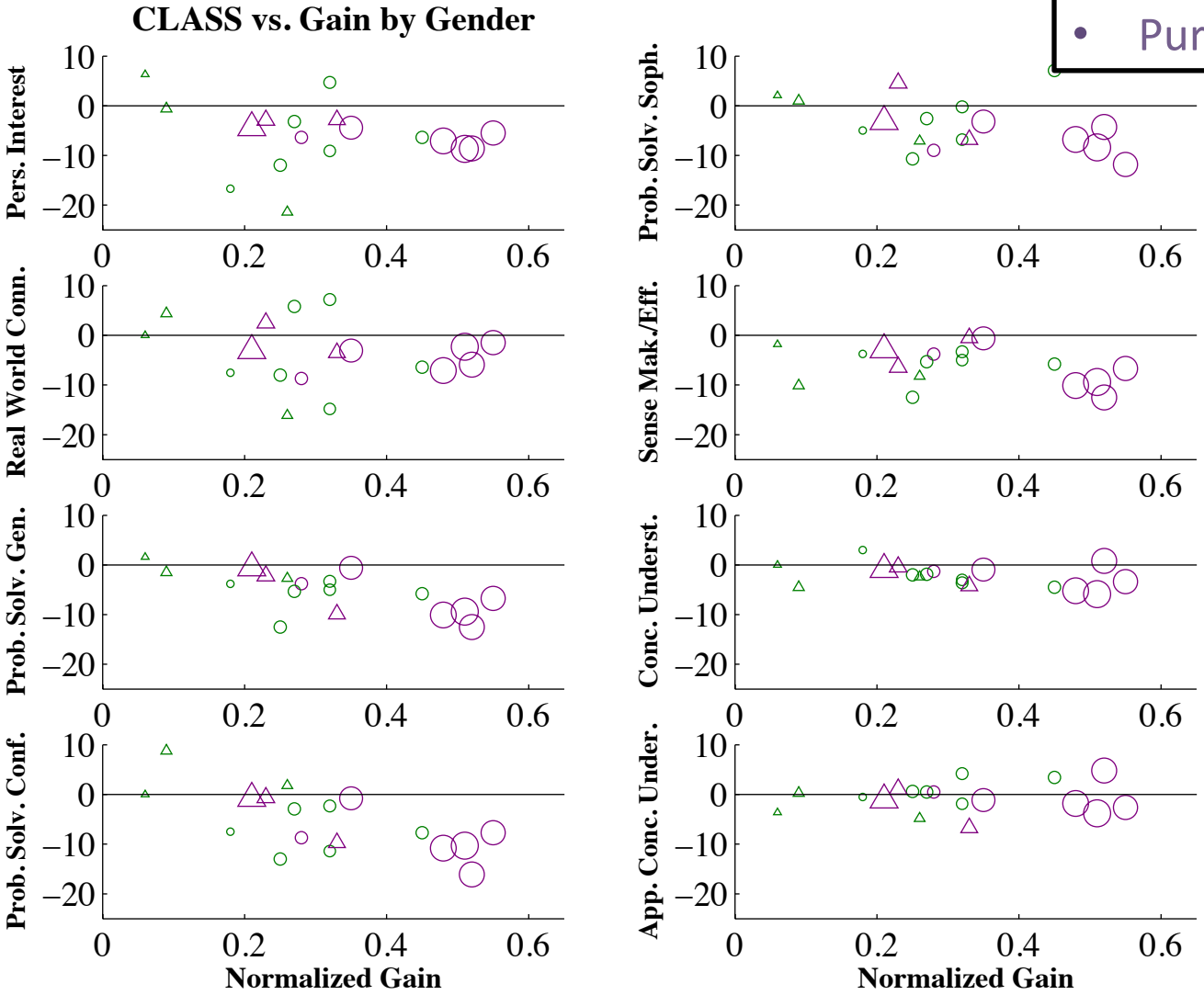
1st Generation

- Size (# CLASS pairs)
- Green (1st generation)
- Purple (Not 1st gen)



Gender gap

- Size (# CLASS pairs)
- Green (female)
- Purple (male)



Successes with LAs at WVU

- Improved learning gains over baseline in both semesters.
- Established program
- Growing longitudinal data set
- Increased appreciation for data-driven improvement among faculty
- Momentum toward continued improvement

Challenges we face

- Fall semester students demographically weaker
- Room for improvement, especially in 2nd course
- Gender gap in achievement gains
- Varied involvement levels among course instructors
- Continuing beyond current grant with new model
- Teacher program: urgent need for revision

Thanks!

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