

Helping Students FIG-ure It Out:

A data-driven look at
First-year Interest Groups



Outline

Researcher

First-year Interest Groups (FIGs)

Data overview

A look at a single project: FIGs

A look at other projects

Course sector timeline

Researcher

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- 4th year PhD student in UW's DataLab
- Research focus is on using large-scale data to better understand social dynamics
- Most work is in Educational Data Mining

What is a FIG?

First-year Interest Groups

- A cluster of classes students take in their first year on campus
- Similar program at many (most?) 4-year schools
- UW program is led by undergraduate students

Stated goals of the FIG program:

- Connect with an experienced student who will help your **Transition** to the UW
- Engage in **Critical Thinking** and begin to build a strong **Academic** foundation
- Experience a small **Community** within a large University
- Explore **Professional Pathways**

How a FIG works

FIGs center on clusters of classes

- Each includes GEN ST 199 – a 2 credit class titled “the University Community”
- Clusters are 2-17 credits (GEN ST 199 along with 0-4 other classes)
- UW’s FIGs are unique in that GEN ST is led by undergraduate upperclassmen



How a FIG works

FIGs also have reserved sections in some of the more popular classes on campus

MATH 124 <u>CALC ANALYT GEOM I</u>		(NW,QSR)	
MATH 111, 112, 120, 124, 125, AND 126: FINAL EXAMINATIONS WILL BE THE SATURDAY IMMEDIATE (DIFFERENT FROM THE PUBLISHED EXAMINATION SCHEDULE). THIS DOES NOT INCLUDE THE PLACEMENT REQUIREMENTS, SEE NOTE AT THE BEGINNING OF THE MATHEMATICS LISTING			
Restr	18045 A 5	MWF 830-920 BAG 154 MATH 124 CANNOT BE OVERLOADED	Open 0/ 120
Restr	18046 AA QZ	T 830-950 Th 830-920 LOW 219 MATH 124 CANNOT BE OVERLOADED	Open 0/ 30
	>18053 BC QZ	T 1000-1120 Th 930-1020 THO 125 MATH 124 CANNOT BE OVERLOADED FIRST-YEAR INTEREST GROUPS (FIGS) ONLY, QUESTIONS VISIT FYP.WASHINGTON.EDU/EXTRASEATS.	0/ 30
Restr	18054 BD QZ	T 830-950 PAR 106 Th 830-920 BLD 392 MATH 124 CANNOT BE OVERLOADED INCLUDES CAMP STUDENTS	Open 0/ 30
Restr	18055 C 5	MWF 1030-1120 CDH 109 MATH 124 CANNOT BE OVERLOADED	Open 0/ 120

FIG Curriculum

GEN ST 199

- 3200 freshman students (some transfer FIGs)
- Academic & Social transition
- Focus on resources used all 4 years (libraries, advisers)
- Building skills for being successful in the classroom (late work, meeting deadlines, interacting with faculty)
- Heavy emphasis on peer experience & learning from different perspectives

GEN ST 470

- 150 FIG Leaders, About 25% return to teach again
- 10-week lesson plans (60% prescribed, 40% FIG Leader-developed)

Objectives & Research Questions

UW Office of Educational Assessment (2009)

- Centered around a single FIG cohort (about 2800 students)
- Focused on how the program was doing with regards to strategic aims; not on the effect of the program on students

This Project:

- What is the impact of FIGs on students' educational pursuits?
- Do FIG students graduate at higher rates and with higher grades than non-FIG students?
 - *How does vary across demographics? How does it vary across STEM fields and majors?*
- How do cohorts and taking classes with the same people play a part in this?

Definitions

Graduate

- someone who earns a baccalaureate degree from the UW within 6 calendar years of first enrollment

Re-enrollee

- someone who completes at least one additional class within one calendar year of the end of their first year at UW

Data Overview

- Current dataset: Spans 20+ years at the University of Washington with information on over 300K students, 200K degrees awarded, and millions of transcript records
 - Includes: all courses taken by all students from mid-90s onwards, all demographic information, all degrees awarded, and application history for students
- Working at scales never before seen in educational data mining and with transcript data that is rarely used for research purposes

The Data

Complete registrar transcript, application, and demographic records

- Students who first enrolled as freshmen at the UW between 1998-2010
- About 58K students (previously 66K)
- Of these students, about 32.5K (56.2%) enrolled in a FIG (previously 36K, 54.5%)

FIG exit surveys from students who enrolled in FIGs between 2010-2015

- Coordinated by First Year Programs
- About 14K responses from students (about 12K usable)
- Mostly open-ended text responses. We have hand-coded much of this now 😊

Additional data sources

- US Census data linked by student application ZIP code
- Enrollment planning services data from the Collegeboard

The good and not-so-good

The good

- Near even split in FIG and non-FIG students
- Variable amount of FIG cluster credits can allow for some interesting insights
 - *How does the number of FIG cluster credits relate to the metrics of interest?*
- Transcript records are complete

The not-so-good

- Survey responses can be linked to transcript data but times don't overlap
- Students self select into FIG and non-FIG groups; no real randomization

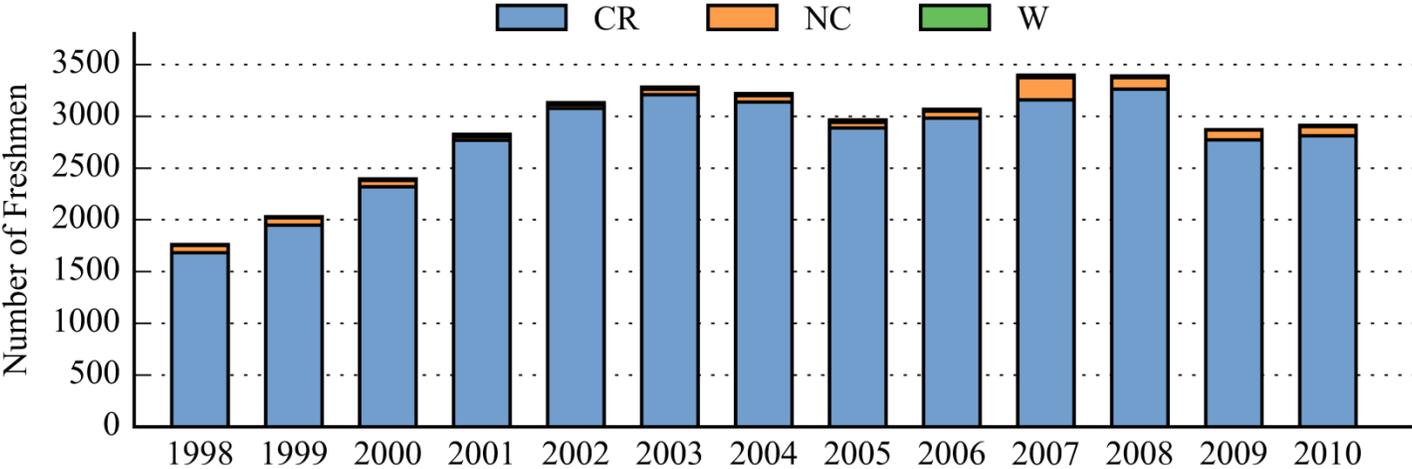
Methods

Propensity score matching using transcript/demographic data

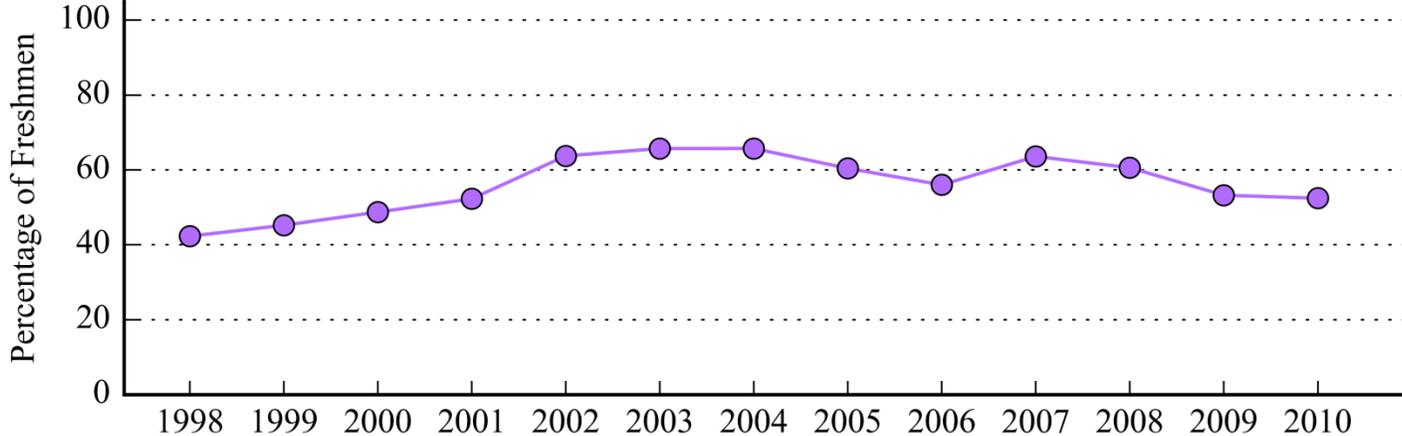
- Using all demographic features available (gender, age, race, etc)
- Using high school information (distance from UW, AP classes, SAT scores, etc)
- Using information pulled from application ZIP code (linked to US census data)
- Now includes information from enrollment planning services (about 150 additional variables)
- Hand-coded/tagged individual responses thereafter

FIG Rates

Counts of FIG students over time



Proportion of incoming freshmen taking a FIG over time



Demographics

	FIG Counts	non-FIG Counts	FIG %ages	non-FIG %ages
Total	36,032	30,028	100	100
Female	20,568	14,537	57.08	48.41
Male	15,432	15,458	42.83	51.48
Unidentified	32	33	0.09	0.11
African American	1,108	844	3.08	2.81
American Indian	569	393	1.58	1.31
Asian	9,380	9,203	26.03	30.65
Caucasian	21,242	14,615	58.95	48.67
Hawaiian/Pac. Islander	310	208	0.86	0.69
Unidentified	3,423	4,765	9.50	15.87
Hispanic	1,870	1,313	5.19	4.37
Not Hispanic/indicated	34,162	28,715	94.81	95.63
Residents	29,140	23,526	80.87	78.35
Non-Residents	6,892	6,502	19.13	21.65

Some differences in demographics between students.

- Female and Caucasian students are over-represented in FIGs
- Male, Asian, and race-unidentified students are under-represented in FIGs

Propensity Scores

The idea: matching students on the probability they will enter a FIG

- Logistic regression model using demographic and pre-entry student data
- Treatment: students in FIGs and control: students not in FIGs
- Matches stratified by year of entry to UW



Variables

Demographic variable examples

- Standard demographics: age at start, gender, race, ethnicity, resident status
- Other demographics: veteran status, athlete status, guardians' schooling level
- ZIP code information: %age of people completing high school and college in ZIP, distance from ZIP to UW, avg. income in ZIP code

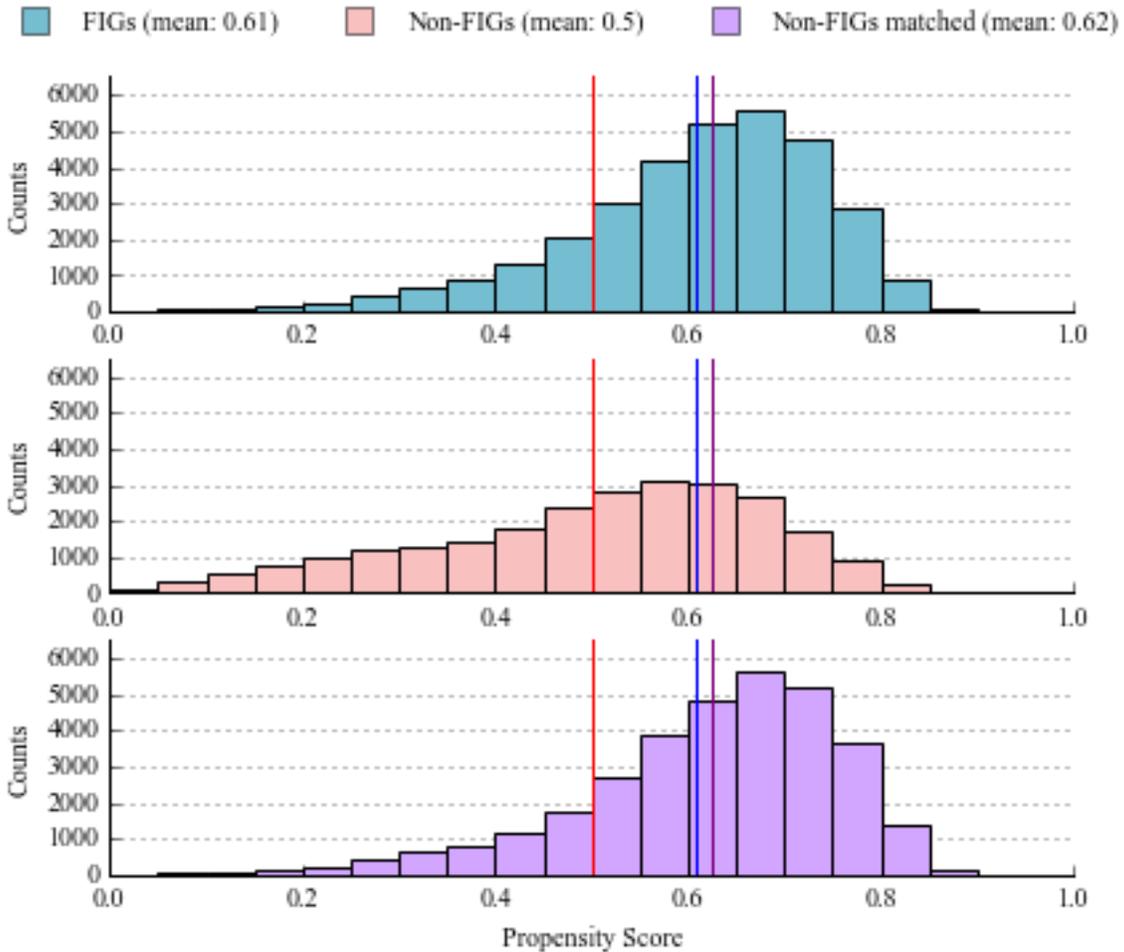
High school information examples

- High school academics: high school GPA; level of math in HS; years of math, science, social science, English, arts, and foreign language in HS
- Pre-college information: SAT scores, running start designations, number of credits transferred to UW

Enrollment planning information examples

- High school level information: Parent's income, parent's education, student college aspirations (size, location, etc), student career aspirations

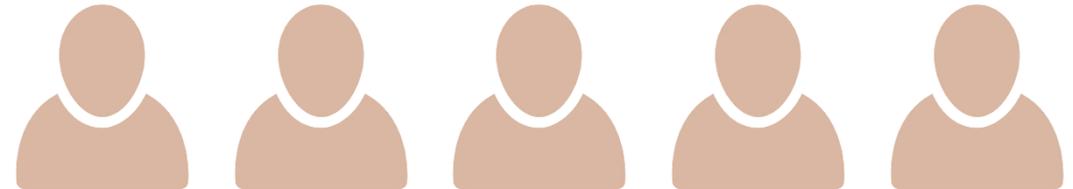
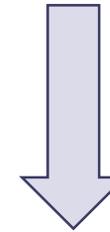
Propensity Scores



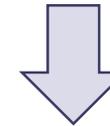
(1) For each FIG student



(2) Take matches from control population. Matches found within a fixed caliper (in this case 1.5%) of propensity score from student in (1)



(3) Matched students comprise the comparison group. Either averaged across matches or matched one to one



Strata for Matching

Students By Entering Year

	Fig	Non-fig
1998	1563	2346
1999	1849	2392
2000	2227	2395
2001	2655	2413
2002	2922	1660
2003	3104	1629
2004	3005	1620
2005	2771	1828
2006	2869	2306
2007	3041	1995
2008	3099	2045
2009	2658	2159
2010	2640	2262

Students By STEM
and Non-STEM

	Fig	Non-fig
STEM	10,420	22,152
Non-STEM	10,029	15,378

Results

Graduation Rates (avg: 78.5%)

Matching strategy	FIG	Non-FIG	Diff
No Limit	81.60%	75.04%	+6.56% (5.89%)
Limit	81.60%	74.49%	+6.11% (5.69%)
No Rep	81.49%	74.94%	+6.55% (6.03%)

Re-Enrollment Rates (avg: 92.5%)

Matching strategy	FIG	Non-FIG	Diff
No Limit	94.19%	90.73%	+3.46% (3.15%)
Limit	94.19%	90.37%	+3.82 (3.27%)
No Rep	94.51%	91.00%	+3.51 (3.26%)

Additional Results

Hispanic and under represented students were re-matched

- Using same strategies as before but only for races/ethnicities of interest

Hispanic Students
(N = 1556) (1696)

	FIG	Non-FIG	Diff
Graduation	77.96%	69.32%	+8.64%
Re-Enroll	93.06%	87.28%	+5.78%

Under Rep. Students
(N = 1410) (1569)

	FIG	Non-FIG	Diff
Graduation	76.81%	62.81%	+14.00%
Re-Enroll	94.75%	88.18%	+6.57%

What is valuable about FIGs?

Some answers from student surveys

- Students were asked “what was the most valuable aspect of the FIG to you?”
- Responses were open-ended text; currently coded
- Very little difference between groups as far as proportions of tags

Over 51% of responses mentioned meeting new people/making friends, of which 11% mentioned friends with similar interests.

Over 23% of students mentioned having people in the same classes and/or forming study groups.

About 13% of students mentioned that it helped them learn survival skills, about the UW, and about campus resources

About 9% of students specifically mentioned their FIG leader in their responses

What is Next

Propensity score matching is more or less complete now

- I feel confident in the results
- Maybe some tweaks with definitions to STEM majors/entrants

Better understanding student perspectives from FIGs (A17)

- Coding and digging deeper into surveys
- Potentially looking at other questions on the survey

Dig into what makes a “good” FIG leader (W18)

Examine differential effects across FIG courseload (W18)

Examine differential and cohort effects across demos/ethnicities (S19?)