Hope to partially answer the following questions:

1. How does affirmative action affect college enrollment?
2. How can affirmative action be harmful to its beneficiaries?
3. How does time-to-degree and choice of major depend on what college one attends?
4. What makes mismatch particularly relevant for the sciences?
5. Mismatch of a different variety: how do individuals sort into friendships?

"Many people are unaware of how few colleges and universities have enough applicants to be able to pick and choose among them. There is no single, unambiguous way of identifying the number of such schools, but we estimate that only about 20 to 30 percent of all four-year colleges and universities are in this category. Nationally, the vast majority of undergraduate institutions accept all qualified candidates and thus do not award special status to any group of applicants, defined by race or on the basis of any other criterion."
(Bowen and Bok, *The Shape of the River*, pp. 16)

Affirmative action primarily affects **where** individuals go to college, not whether they go at all.
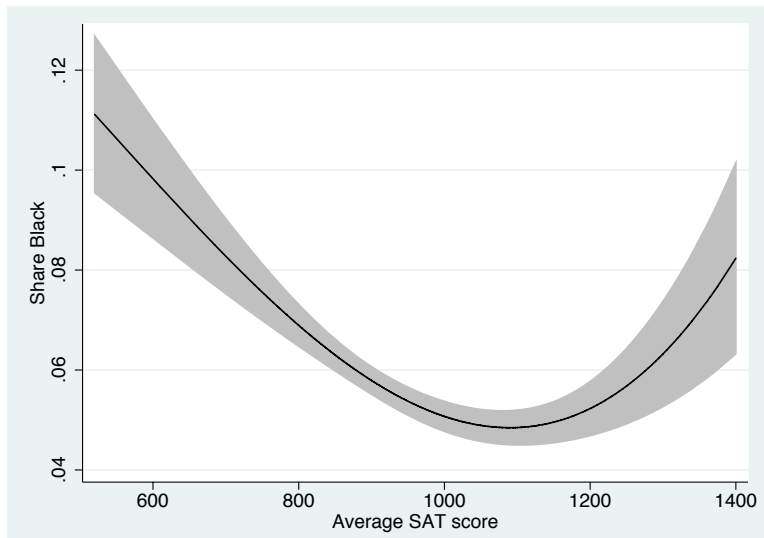
One argument that is sometimes made against affirmative action is that it places minorities at schools where they will not succeed: minorities would be better off without affirmative action

Economists generally balk at this idea: affirmative action expands choice sets for minorities and more choices should be good

Ex ante mismatch is a possibility when universities have **private information** as to how well students are going to perform

Disentangling Private Information

Using data from Duke, Arcidiacono, Aucejo, Fang, and Spenner (2011) show:

- On average, students dramatically over-predict their grades
- Duke students have virtually no private information about their grades
- Duke has substantial private information about how well students are going to perform.
- Bad grade surprises result in:
    - Students being less satisfied with themselves
    - Moves away from STEM fields
    - Less likely to report that they would attend Duke again

Arcidiacono, Aucejo, and Hotz (2012) use data from the University of California system to look at how the match between the school and the student affects:

- How a student's choice of major changes over time
- How time to degree depends on the match

For every student who applied to the UC system between 1995-2000,

- Application and admissions decisions
- Broad racial categories
- Measures of preparation (SAT scores, high school grades)
- Admissions decisions for all schools where the student submitted an application

Data are reported in three year intervals: three years before Prop 209 and three years after.

1995-1997 Average SAT Scores and Graduation Rates by Majority-Minority Status

	Berk	LA	San Diego	Davis	Irvine	Santa Barb	Santa Cruz	River	
				Average SAT scores					
Maj	1335	1279	1245	1183	1136	1156	1164	1101	
Min	1142	1119	1122	1072	1026	1024	1020	965	
				5 year graduation rates					
Maj	85.7%	82.7%	78.9%	75.0%	67.3%	70.3%	65.2%	61.0%	
Min	68.0%	65.6%	65.3%	54.3%	62.4%	59.1%	59.6%	58.4%	
				4 year graduation rates					
Maj	55.7%	52.1%	54.3%	38.8%	36.9%	46.5%	43.0%	42.0%	
Min	34.7%	31.1%	37.5%	22.1%	28.4%	31.6%	36.9%	33.6%	
				Share of students					
Min	22.1%	25.3%	12.5%	14.7%	13.1%	18.0%	17.5%	25.0%	

1995-1997 SAT Scores by School, Majority-Minority Status, Initial and Final (5 Year) Major

Final Major	Berk	LA	San Diego	Davis	Irvine	Santa Barb	Santa Cruz	River
Majority students, initial major science (SAT, share)								
SCI	1362	1301	1268	1229	1172	1192	1172	1120
	60.6%	51.8%	50.6%	46.3%	35.5%	34.2%	28.6%	31.3%
NSCI	1341	1285	1241	1197	1140	1151	1152	1053
	25.2%	28.4%	26.1%	27.4%	29.9%	31.2%	33.6%	24.2%
DNF	1346	1275	1224	1200	1130	1151	1136	1074
	14.1%	19.8%	23.3%	26.3%	34.7%	34.5%	37.8%	44.5%
Minority students, initial major science (SAT, share)								
SCI	1275	1179	1178	1180	1111	1094	1073	1035
	30.5%	28.4%	31.0%	25.6%	23.8%	25.6%	19.7%	20.0%
NSCI	1170	1128	1108	1105	1044	1026	1019	967
	36.1%	32.5%	32.7%	25.6%	36.3%	30.7%	31.8%	27.9%
DNF	1178	1113	1099	1100	1046	1018	1001	968
	33.4%	39.1%	36.4%	48.9%	39.9%	43.7%	48.5%	52.1%

Minority 5 Year Graduation Rates by School, SAT Quartile, and Initial Major

SAT Quart	Berk	LA	San Diego	Davis	Irvine	Santa Barb	Santa Cruz	River
Probability of graduating in science, starting in science								
Q1	12.4%	17.3%	20.1%	15.5%	18.4%	19.2%	16.0%	16.9%
Q2	17.5%	29.8%	31.6%	24.9%	27.0%	29.3%	26.0%	30.0%
Q3	45.1%	38.3%	38.7%	41.8%	30.0%	46.3%	20.8%	22.2%
Q4	46.2%	42.9%	56.3%	43.4%	50.0%	50.0%	33.3%	33.3%
Probability of graduating in any major, starting in science								
Q1	58.8%	52.3%	56.4%	42.5%	59.8%	51.5%	47.2%	46.1%
Q2	65.0%	62.2%	65.1%	55.8%	58.4%	60.0%	60.0%	54.0%
Q3	73.8%	68.2%	68.0%	57.0%	58.0%	68.3%	50.0%	55.6%
Q4	67.5%	71.4%	77.1%	58.5%	76.9%	75.0%	66.7%	33.3%

Minority 4 Year Graduation Rates by School, SAT Quartile, and Initial Major

SAT Quart	Berk	LA	San Diego	Davis	Irvine	Santa Barb	Santa Cruz	River
Probability of graduating in science, starting in science								
Q1	3.1%	3.5%	7.3%	2.9%	5.8%	7.9%	8.3%	10.7%
Q2	7.0%	9.2%	18.1%	6.6%	11.0%	14.0%	14.0%	16.0%
Q3	20.5%	15.6%	20.0%	22.8%	16.0%	29.3%	16.7%	11.1%
Q4	26.5%	22.2%	25.0%	24.5%	30.8%	33.3%	33.3%	33.3%
Probability of graduating in any major, starting in science								
Q1	16.5%	13.0%	21.3%	12.0%	18.3%	18.1%	24.2%	24.7%
Q2	22.0%	21.1%	33.1%	16.9%	25.3%	23.5%	29.9%	27.6%
Q3	34.6%	28.0%	34.1%	32.5%	30.3%	37.5%	31.7%	20.1%
Q4	38.4%	34.4%	37.6%	33.1%	44.3%	39.9%	46.9%	39.7%

Predicted Minority 5 Year Graduation Rates by School, SAT Quartile, and Initial Major

SAT Quart	Berk	LA	San Diego	Davis	Irvine	Santa Barb	Santa Cruz	River
Probability of graduating in science, starting in science								
Q1	11.1%	14.7%	17.7%	15.4%	15.6%	21.1%	20.9%	22.2%
Q2	22.9%	26.9%	29.0%	28.4%	27.4%	34.9%	31.3%	37.4%
Q3	32.8%	36.3%	37.1%	38.2%	36.3%	44.1%	38.4%	47.2%
Q4	43.7%	46.1%	45.5%	48.4%	45.5%	53.4%	45.6%	56.9%
Probability of graduating in any major, starting in science								
Q1	53.0%	50.7%	52.0%	47.9%	54.9%	51.1%	55.1%	53.8%
Q2	61.6%	60.0%	59.3%	56.9%	62.8%	59.1%	62.4%	61.1%
Q3	66.9%	65.6%	63.8%	62.5%	67.6%	64.0%	66.7%	65.6%
Q4	72.3%	71.3%	68.4%	68.3%	72.4%	69.0%	71.1%	70.3%

Predicted Minority 4 Year Graduation Rates by School, SAT Quartile, and Initial Major

SAT Quart	Berk	LA	San Diego	Davis	Irvine	Santa Barb	Santa Cruz	River
Probability of graduating in science, starting in science								
Q1	2.1%	3.0%	6.2%	4.0%	4.8%	8.0%	11.9%	13.3%
Q2	7.4%	8.1%	13.9%	11.0%	11.0%	17.4%	20.2%	27.8%
Q3	14.7%	14.2%	21.6%	19.0%	17.6%	26.2%	26.9%	39.6%
Q4	25.0%	22.2%	30.6%	29.1%	25.5%	36.1%	34.2%	51.6%
Probability of graduating in any major, starting in science								
Q1	15.5%	12.5%	20.3%	13.1%	17.4%	18.2%	27.7%	27.4%
Q2	22.4%	20.0%	28.9%	21.3%	25.4%	27.0%	36.0%	39.4%
Q3	28.8%	26.6%	35.7%	28.7%	31.9%	34.4%	41.9%	48.7%
Q4	36.8%	34.4%	43.2%	37.6%	39.0%	42.6%	47.8%	58.0%

Using data from Duke University, Arcidiacono, Aucejo, and Spenner (2012) look at (among other things):

- How persistence in the sciences varies by race
- How much of the racial gap in persistence is due to preparation
- How majors differ in the demands they place on students
- Why students say they switch majors

	White	Black	White Male	Black Male	White Female	Black Female
Final Major (%)						
Humanities/Social Sci	49.5	70.4	36.4	65.0	65.6	72.3
Natural Sci/Eng/Econ	50.5	29.6	63.6	35.0	34.4	27.7
Expected Major (%)						
Humanities/Social Sci	39.2	38.3	31.3	23.3	49.0	44.0
Natural Sci/Eng/Econ	60.8	61.7	68.7	76.7	51.0	56.0

Note: Expected major was reported in the summer previous coming to Duke.

Differences Across Majors

Classes in STEM fields and economics are more likely:

- to give lower grades
  - African American freshmen have grades that are 0.77 points lower in STEM and economics classes
- to require more study time,
  - half-hour to forty five minutes a week more studying from replacing a humanities/social science course with a STEM or economics course
- to be the student's most challenging course
  - 76% of African American freshmen report that their most challenging class is a STEM or economics class.

Clear differences in persistence rates in STEM fields and economics by race/ethnicity. From most likely to leave to least likely:

1. African American
2. Hispanic
3. White
4. Asian

Controlling for academic background (SAT score, Duke's private ranking, or, alternatively, performance in the first year) results in **no racial or ethnic differences** in persistence.

Racial and ethnic differences in persistence result in large part from differences in one's academic background and one's background relative to one's peers.

Students surveyed in their sophomore year were asked if they switched majors and, if so, why. Two of the answers were:

- Lack of pre-college academic preparation for the major course requirements
- Academic difficulty in the major course requirements

African Americans and Hispanics were more likely to have switched majors because of lack of preparation or academic difficulty, as were those who were leaving the sciences.

Controlling for academic background again resulted in no significant racial or ethnic differences.

- Sociologists have a concept called 'homophily' which means that you want to hang out with people like you
- One of the concerns with affirmative action is that it can lead to segregation due to creating a mismatch between majority and minority characteristics.
- For example, individuals are likely to hang out with others of similar academic backgrounds.
- The marginal affirmative action enrollee at Duke may be more likely to hang out with white students at the school they would have attended absent affirmative action.

Using data from the College & Beyond, Arcidiacono, Khan, and Vigdor (2011) show

- Increasing the SAT score of a white person at a particular school makes it more likely that the individual will know Asians, less likely they will know African Americans
- Some evidence of statistical discrimination: increasing the share of African Americans with higher test scores than one's own makes interaction more likely than increasing the share with test scores lower than one's own
- Simulation results suggest that substantially reducing affirmative action would actually lead to more cross-racial interaction

1. How does affirmative action affect college enrollment?
   - **affects where, not whether, minorities attend**
2. How can affirmative action be harmful to its beneficiaries?
   - **lack of information**
3. How does time-to-degree and choice of major depend on what college one attends?
   - **within a school, the least prepared are more likely to switch out of the sciences and take longer to graduate**
4. What makes mismatch particularly relevant for the sciences?
   - **on average, sciences grade harder, require more studying and the returns to preparation are higher**
5. How do individuals sort into friendships?
   - **relationships are more likely to be formed with individuals of similar backgrounds**