Research Methods - Assignment 3

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1 Load data

Data loaded from: https://raw.githubusercontent.com/bocowgill-collaborations/ResearchMethods-Repository/master/HW3/sports-and-education.csv

2 Balance table

Table 1: Balance Table of Obersvable Variables Between Treatment and Control

Measure	Non-Ranked (M)	Non-Ranked (SD)	Ranked (M)	Ranked (SD)	p
Academic Quality	0.52	0.3	0.47	0.28	0.401
Athletic Quality	0.42	0.28	0.55	0.28	0.025
Near Big Market	0.36		0.7		0.001

Note. Near big market row indicates the percentage of colleges that are located near a big market city

3 Interpretation of balance table

Well, it looks like colleges in the treatment condition and control condition are too similar in their athletic quality and their proximity to a big market. Well, this means that the assignment to condition is not random, as it is clearly influenced by some important factors. This will hurt any propensity score model we try build because, if we find an effect, it will be unclear if it is driven by the treatment or by schools' athletic quality and proximity to a big market.

4 Propensity score model

Factor coefficients

See Table 2.

It looks like athletic quality is somewhat predictive of being ranked in college basketball (treatment) and that being near a big market is highly predictive of this.

Table 2: Linear model predicting the likelihood of a college being in the treatment condition (vs. control)

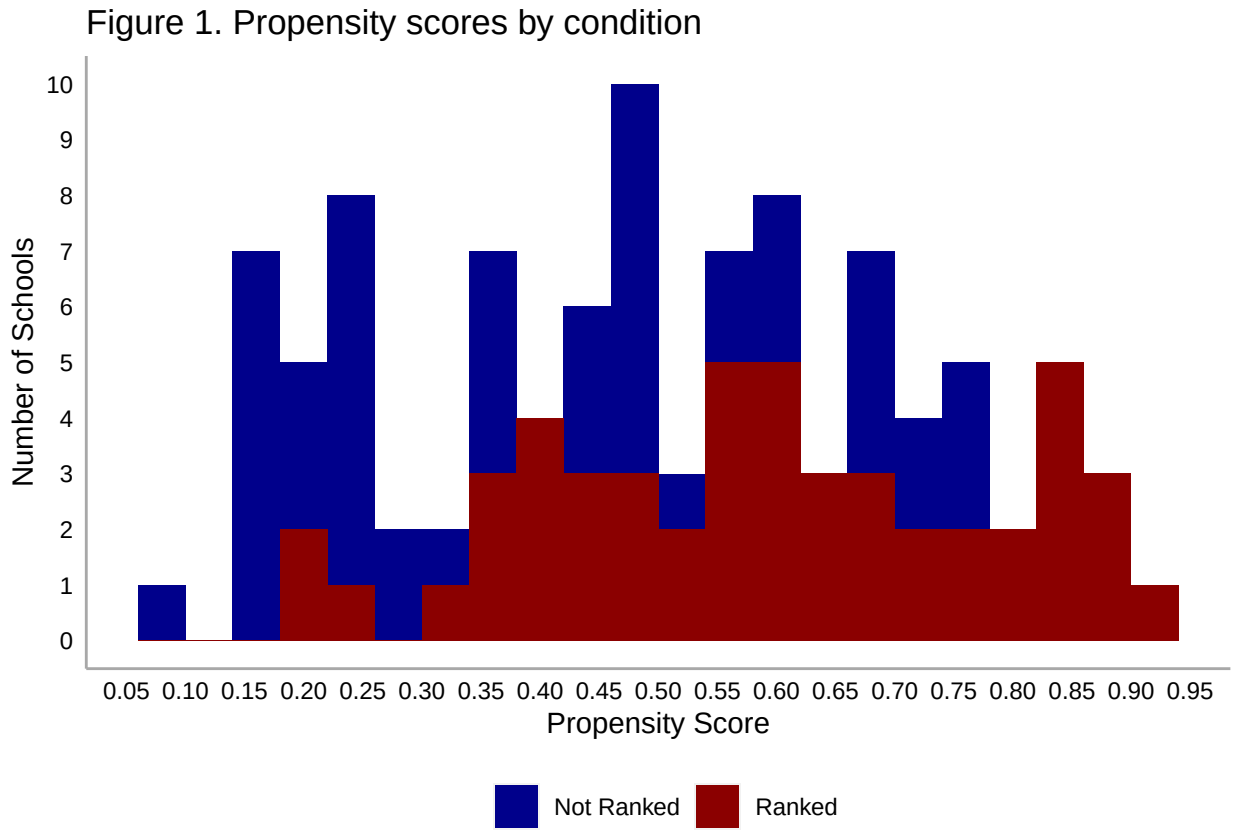
Predictor	b	95% CI	$t(96)$	p
Intercept	0.20	[−0.06, 0.46]	1.54	.128
Academic Quality	-0.18	[−0.50, 0.14]	-1.14	.258
Athletic Quality	0.41	[0.09, 0.74]	2.53	.013
Near Big Market	0.36	[0.17, 0.54]	3.84	$< .001$

Probability of treatment for each college

See Tables 3, 4, and 5.

5 Overlap in propensity score between conditions

See Figure 1



It looks from Figure 1 that colleges with propensity scores of under .20 and .80 and over have no overlap between ranked and non-ranked. So I'll drop those.

6 Blocking by propensity scores

The remaining 82 colleges are now in blocks of four, grouped by propensity scores.

7 Treatment effect on alumni donations

See Table 6 for output of fixed effects model examining the effect of colleges being ranked in college basketball in 2017 on alumni donations in 2018.

Table 3: The probability of each college to be ranked in basketball (1-33)

College ID	Probability
21	0.83
95	0.90
38	0.77
18	0.84
63	0.72
100	0.64
6	0.56
73	0.42
15	0.70
25	0.59
61	0.43
32	0.84
87	0.78
40	0.83
16	0.32
85	0.42
55	0.56
49	0.83
69	0.48
24	0.56
59	0.66
80	0.75
66	0.90
97	0.71
36	0.54
68	0.20
99	0.36
51	0.44
39	0.89
98	0.62
76	0.47
96	0.35
5	0.65

Note. Based on their academic quality, athletics quality, and proximity to a big market

Table 4: The probability of each college to be ranked in basketball (34-67)

College ID	Probability
19	0.60
30	0.44
43	0.66
77	0.49
20	0.42
4	0.61
86	0.66
57	0.25
33	0.55
90	0.21
53	0.89
48	0.36
10	0.38
91	0.55
82	0.53
41	0.61
89	0.80
78	0.47
1	0.46
74	0.49
37	0.24
70	0.74
75	0.16
3	0.77
23	0.33
27	0.59
79	0.70
8	0.46
44	0.16
7	0.48
84	0.77
83	0.43
26	0.73
31	0.51

Note. Based on their academic quality, athletics quality, and proximity to a big market

Table 5: The probability of each college to be ranked in basketball (68-100)

College ID	Probability
64	0.26
9	0.58
42	0.25
94	0.58
14	0.26
56	0.56
45	0.18
13	0.24
81	0.70
88	0.35
47	0.67
52	0.29
17	0.71
12	0.56
50	0.19
67	0.28
11	0.68
54	0.21
22	0.20
2	0.45
34	0.36
62	0.16
65	0.08
71	0.48
92	0.37
93	0.45
46	0.16
58	0.18
35	0.48
28	0.37
72	0.16
29	0.25
60	0.24

Note. Based on their academic quality, athletics quality, and proximity to a big market

Table 6: Fixed effects model testing the effect of being ranked in college basketball on alumni donations

	b	SE	t	df	p
(Intercept)	0.06	0.34	0.17	49.67	.864
Ranked.20171	500.47	0.22	2,308.24	76.97	$< .001$
Near.Big.Market	999.81	0.24	4,090.38	23.03	$< .001$
Athletic.Quality	50.05	0.44	113.31	50.31	$< .001$
Academic.Quality	99.78	0.39	256.65	76.35	$< .001$

Note. Model adjusts for proximity to big market, atheltic quality, and academic quality. It also holds proximity score blocking as a fixed effect