

Analysis of the November 2016 San Francisco Election Results

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Feature creation

Now we need to do feature creation and cleaning. We don't care about over vote on its own, so we'll certainly drop that. In precincts where there was no over vote for a certain binary measure (unlikely but possible), this would still be overdefined (i.e. yes + no + under = ballots cast), so we'll drop under votes as well. We'll then normalize the yes votes as yes/(yes+no), which we'll call "yes_of_accepted", and drop the no votes. For races with people, we'll drop write-in since I'd be shocked if that had any useful information, and then normalize the rest of the votes as candidate / ballots_cast. For every measure we'll also create a feature calculated and ballots cast / registration, called which we'll call "turnout"

To make sure that dropping over votes is ok, let's look at the average percent of ballots cast that were over votes:

On average, 0.111% of the ballots cast for a measure were over votes, so we don't need to worry too much about their interpretation.

Now let's transform the features for all of the measures as discussed above:

Understanding the District 5 Supervisor Race

A race near and dear to me. Let's start by just checking out what the Dean vote percent correlates with:

	Second.Variable	Correlation
1309	board_of_supervisors_district_5_london_breed	-0.8381209
3286	state_proposition_60_yes_of_accepted	-0.7942342
2298	member_community_college_board_tom_temprano	0.7854591
1307	state_senate_district_11_jane_kim	0.7261804
4882	local_measure_n_yes_of_accepted	0.7185520
5186	local_measure_r_yes_of_accepted	-0.7116213
1462	superior_court_judge_seat_7_paul_henderson	-0.7107428
3590	state_proposition_64_yes_of_accepted	0.7061534
1614	member_board_of_education_mark_sanchez	0.7020750
1386	superior_court_judge_seat_7_victor_hwang	0.7001912
2830	state_proposition_54_yes_of_accepted	0.6991095
5034	local_measure_p_yes_of_accepted	-0.6879823
4958	local_measure_o_yes_of_accepted	-0.6838210
1690	member_board_of_education_stevon_cook	0.6774235
5110	local_measure_q_yes_of_accepted	-0.6748343
2754	state_proposition_53_yes_of_accepted	-0.6737297
3742	state_proposition_66_yes_of_accepted	-0.6715417
3818	state_proposition_67_yes_of_accepted	0.6711243
2526	member_community_college_board_rafael_mandelman	0.6653152
2222	member_community_college_board_amy_bacharach	-0.6616987
5566	local_measure_w_yes_of_accepted	0.6565300
3210	state_proposition_59_yes_of_accepted	0.6539965
4350	local_measure_g_yes_of_accepted	0.6397168

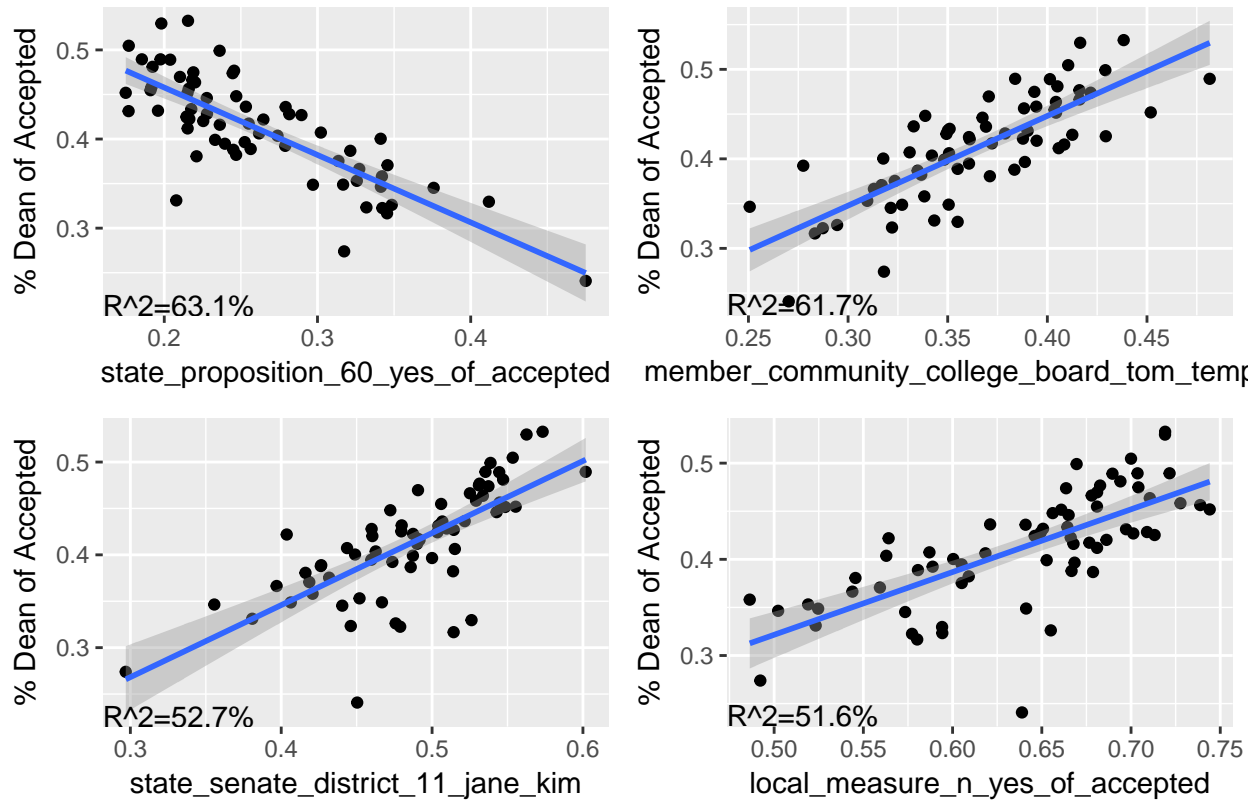
	Second.Variable	Correlation
1308	state_senate_district_11_scott_wiener	-0.6345696
3438	state_proposition_62_yes_of_accepted	0.6252910
4654	local_measure_k_yes_of_accepted	0.6171306
1994	member_board_of_education_rachel_norton	-0.6061720
1538	member_board_of_education_matt_haney	0.6004709
5718	district_measure_rr_yes_of_accepted	0.5826214
5414	local_measure_u_yes_of_accepted	-0.5820502
5490	local_measure_v_yes_of_accepted	0.5796232
1296	president_and_vice_president_jill_stein__ajamu_baraka	0.5775917
2450	member_community_college_board_alex_randolph	-0.5580789
4730	local_measure_l_yes_of_accepted	0.5346416
4122	local_measure_d_yes_of_accepted	0.5312494
5262	local_measure_s_yes_of_accepted	0.5246447
2146	member_board_of_education_phil_kim	-0.5246186
4806	local_measure_m_yes_of_accepted	0.5213327
3970	school_measure_b_yes_of_accepted	0.5112187
3058	state_proposition_57_yes_of_accepted	0.5107151
1305	us_representative_district_12_preston_picus	0.5028828
4274	local_measure_f_yes_of_accepted	0.5016628
4046	local_measure_c_yes_of_accepted	0.4888632
1303	us_senator_kamala_d_harris	0.4820357
3666	state_proposition_65_yes_of_accepted	-0.4770029
2906	state_proposition_55_yes_of_accepted	0.4720482
3134	state_proposition_58_yes_of_accepted	0.4696456
1842	member_board_of_education_trevor_mcneil	-0.4680524
5642	local_measure_x_yes_of_accepted	0.4503712
4426	local_measure_h_yes_of_accepted	0.4380544
1304	us_senator_loretta_l_sanchez	-0.4348393
2982	state_proposition_56_yes_of_accepted	0.4293044
5338	local_measure_t_yes_of_accepted	0.4254761
1302	president_and_vice_president_donald_j_trump__michael_r_pence	-0.4196710
4578	local_measure_j_yes_of_accepted	0.4102077
2678	state_proposition_52_yes_of_accepted	0.4049508
3514	state_proposition_63_yes_of_accepted	0.3895119
1293	president_and_vice_president_writein_bernard_bernie_sanders__tu	0.3885001
4198	local_measure_e_yes_of_accepted	0.3884201
1766	member_board_of_education_jill_wynns	-0.3732614
3894	school_measure_a_yes_of_accepted	0.3602238
2374	member_community_college_board_shanell_williams	0.3521533
1298	president_and_vice_president_hillary_clinton__tim_kaine	0.3458861
2602	state_proposition_51_yes_of_accepted	-0.3424784
2070	member_board_of_education_rob_geller	-0.2940330
1299	president_and_vice_president_writein_laurence_kotlikoff__edward_l	0.1937525
1306	us_representative_district_12_nancy_pelosi	-0.1671349
3362	state_proposition_61_yes_of_accepted	-0.1646139
1300	president_and_vice_president_gloria_estela_la_riva__dennis_j_bank	-0.1318285
1301	president_and_vice_president_writein_mike_maturen__juan_munoz	-0.1262029
1295	president_and_vice_president_writein_jerry_white__niles_niemuth	0.1204393
4502	local_measure_i_yes_of_accepted	0.0910700
1918	member_board_of_education_ian_kalin	-0.0683548
1294	president_and_vice_president_gary_johnson__bill_weld	0.0581826
1297	president_and_vice_president_writein_evan_mcmullin__nathan_johnso	-0.0560786

	Second.Variable	Correlation
18	president_and_vice_president_writein_bernard_bernie_sanders__tu	0.0000000
94	president_and_vice_president_gary_johnson_bill_weld	0.0000000
170	president_and_vice_president_writein_jerry_white_niles_niemuth	0.0000000
246	president_and_vice_president_jill_stein_ajamu_baraka	0.0000000
322	president_and_vice_president_writein_evan_mcmullin_nathan_johnso	0.0000000
398	president_and_vice_president_hillary_clinton_tim_kaine	0.0000000
474	president_and_vice_president_writein_laurence_kotlikoff_edward_l	0.0000000
550	president_and_vice_president_gloria_estela_la_riva_dennis_j_bank	0.0000000
626	president_and_vice_president_writein_mike_maturen_juan_munoz	0.0000000
702	president_and_vice_president_donald_j_trump_michael_r_pence	0.0000000
778	us_senator_kamala_d_harris	0.0000000
854	us_senator_loretta_l_sanchez	0.0000000
930	us_representative_district_12_preston_picus	0.0000000
1006	us_representative_district_12_nancy_pelosi	0.0000000
1082	state_senate_district_11_jane_kim	0.0000000
1158	state_senate_district_11_scott_wiener	0.0000000
1234	board_of_supervisors_district_5_london_breed	0.0000000
1310	board_of_supervisors_district_5_dean_preston	0.0000000
1311	superior_court_judge_seat_7_victor_hwang	0.0000000
1312	superior_court_judge_seat_7_paul_henderson	0.0000000
1313	member_board_of_education_matt_haney	0.0000000
1314	member_board_of_education_mark_sanchez	0.0000000
1315	member_board_of_education_stevon_cook	0.0000000
1316	member_board_of_education_jill_wynns	0.0000000
1317	member_board_of_education_trevor_mcneil	0.0000000
1318	member_board_of_education_ian_kalin	0.0000000
1319	member_board_of_education_rachel_norton	0.0000000
1320	member_board_of_education_rob_geller	0.0000000
1321	member_board_of_education_phil_kim	0.0000000
1322	member_community_college_board_amy_bacharach	0.0000000
1323	member_community_college_board_tom_temprano	0.0000000
1324	member_community_college_board_shanell_williams	0.0000000
1325	member_community_college_board_alex_randolph	0.0000000
1326	member_community_college_board_rafael_mandelman	0.0000000
1327	state_proposition_51_yes_of_accepted	0.0000000
1328	state_proposition_52_yes_of_accepted	0.0000000
1329	state_proposition_53_yes_of_accepted	0.0000000
1330	state_proposition_54_yes_of_accepted	0.0000000
1331	state_proposition_55_yes_of_accepted	0.0000000
1332	state_proposition_56_yes_of_accepted	0.0000000
1333	state_proposition_57_yes_of_accepted	0.0000000
1334	state_proposition_58_yes_of_accepted	0.0000000
1335	state_proposition_59_yes_of_accepted	0.0000000
1336	state_proposition_60_yes_of_accepted	0.0000000
1337	state_proposition_61_yes_of_accepted	0.0000000
1338	state_proposition_62_yes_of_accepted	0.0000000
1339	state_proposition_63_yes_of_accepted	0.0000000
1340	state_proposition_64_yes_of_accepted	0.0000000
1341	state_proposition_65_yes_of_accepted	0.0000000
1342	state_proposition_66_yes_of_accepted	0.0000000
1343	state_proposition_67_yes_of_accepted	0.0000000
1344	school_measure_a_yes_of_accepted	0.0000000

	Second.Variable	Correlation
1345	school_measure_b_yes_of_accepted	0.0000000
1346	local_measure_c_yes_of_accepted	0.0000000
1347	local_measure_d_yes_of_accepted	0.0000000
1348	local_measure_e_yes_of_accepted	0.0000000
1349	local_measure_f_yes_of_accepted	0.0000000
1350	local_measure_g_yes_of_accepted	0.0000000
1351	local_measure_h_yes_of_accepted	0.0000000
1352	local_measure_i_yes_of_accepted	0.0000000
1353	local_measure_j_yes_of_accepted	0.0000000
1354	local_measure_k_yes_of_accepted	0.0000000
1355	local_measure_l_yes_of_accepted	0.0000000
1356	local_measure_m_yes_of_accepted	0.0000000
1357	local_measure_n_yes_of_accepted	0.0000000
1358	local_measure_o_yes_of_accepted	0.0000000
1359	local_measure_p_yes_of_accepted	0.0000000
1360	local_measure_q_yes_of_accepted	0.0000000
1361	local_measure_r_yes_of_accepted	0.0000000
1362	local_measure_s_yes_of_accepted	0.0000000
1363	local_measure_t_yes_of_accepted	0.0000000
1364	local_measure_u_yes_of_accepted	0.0000000
1365	local_measure_v_yes_of_accepted	0.0000000
1366	local_measure_w_yes_of_accepted	0.0000000
1367	local_measure_x_yes_of_accepted	0.0000000
1368	district_measure_rr_yes_of_accepted	0.0000000

Nothing too surprising or counterintuitive in the top couple - London correlating against Dean so strongly obviously makes sense, and, as noted before, a precinct's choice of supervisor is most strongly correlated with whether or not it wanted mandatory condom use in porn (State Prop 60), hilariously enough. Let's look at plots of the top 4 (excluding London):

Strongest Dean Correlations



Breaking it down

Doing a series of linear regressions against other ballot measures doesn't get us very far in understanding the factors underlying the results of the District 5 supervisor race. The State Prop 60 (mandatory condom use in porn) result correlating so strongly with the Dean vote hilarious and weird, but not super surprising - there's probably a latent age variable underlying it. Tom Temprano essentially ran with Dean, basically every voter guide that endorsed Dean also endorsed Jane Kim, and, while I wouldn't have guessed Prop N (non-citizen voting in school board elections) would be number 4, it also obviously isn't surprising when viewed from the traditional left/right political paradigm.

We want to essentially understand the latent variables underlying the election results. The way to get to latent variables, in a formal sense, would be something like factor analysis or partial least squares regression. However, we're going to use principal components analysis. Why? I'm more familiar with it, and it almost always gives a very similar result to factor analysis. Perhaps most importantly, though, principal components are by definition orthogonal, whereas latent variables are not necessarily orthogonal. I'll explain why I think that's a desirable property for this interpretation after we calculate the principal components.

Our approach here will essentially be a home-cooked version of principal components regression:

- Do dimensionality reduction using PCA
- Find the principal components that correlate most strongly with some measure in which we are interested (first, the district 5 supervisor race)
- Check how much these of the variance in our response (Dean) the PCs explain when used in a multiple linear regression, and choose how many to keep for the sake of parsimony
- Test whether those same principal components also explain a good chunk of the variance in other measures where there's a clear progressive/moderate split

As mentioned above, we'll first try this on the D5 supervisor race because I'm personally attached to it and I wanna know what happened, dammit!

```
##                               First.Variable
## 507 board_of_supervisors_district_5_dean_preston
## 509 board_of_supervisors_district_5_dean_preston
## 526 board_of_supervisors_district_5_dean_preston
## 527 board_of_supervisors_district_5_dean_preston
## 516 board_of_supervisors_district_5_dean_preston
## 513 board_of_supervisors_district_5_dean_preston
## 520 board_of_supervisors_district_5_dean_preston
## 523 board_of_supervisors_district_5_dean_preston
## 518 board_of_supervisors_district_5_dean_preston
## 528 board_of_supervisors_district_5_dean_preston
## 522 board_of_supervisors_district_5_dean_preston
## 521 board_of_supervisors_district_5_dean_preston
## 512 board_of_supervisors_district_5_dean_preston
## 508 board_of_supervisors_district_5_dean_preston
## 519 board_of_supervisors_district_5_dean_preston
## 510 board_of_supervisors_district_5_dean_preston
## 525 board_of_supervisors_district_5_dean_preston
## 515 board_of_supervisors_district_5_dean_preston
## 511 board_of_supervisors_district_5_dean_preston
## 524 board_of_supervisors_district_5_dean_preston
## 517 board_of_supervisors_district_5_dean_preston
## 514 board_of_supervisors_district_5_dean_preston
## 23  board_of_supervisors_district_5_dean_preston
## 46  board_of_supervisors_district_5_dean_preston
## 69  board_of_supervisors_district_5_dean_preston
## 92  board_of_supervisors_district_5_dean_preston
## 115 board_of_supervisors_district_5_dean_preston
## 138 board_of_supervisors_district_5_dean_preston
## 161 board_of_supervisors_district_5_dean_preston
## 184 board_of_supervisors_district_5_dean_preston
## 207 board_of_supervisors_district_5_dean_preston
## 230 board_of_supervisors_district_5_dean_preston
## 253 board_of_supervisors_district_5_dean_preston
## 276 board_of_supervisors_district_5_dean_preston
## 299 board_of_supervisors_district_5_dean_preston
## 322 board_of_supervisors_district_5_dean_preston
## 345 board_of_supervisors_district_5_dean_preston
## 368 board_of_supervisors_district_5_dean_preston
## 391 board_of_supervisors_district_5_dean_preston
## 414 board_of_supervisors_district_5_dean_preston
## 437 board_of_supervisors_district_5_dean_preston
## 460 board_of_supervisors_district_5_dean_preston
## 483 board_of_supervisors_district_5_dean_preston
## 506 board_of_supervisors_district_5_dean_preston
## 529 board_of_supervisors_district_5_dean_preston
##                               Second.Variable  Correlation
## 507                                           PC1 -0.769873783
## 509                                           PC3  0.425063629
## 526                                           PC20 -0.158223682
## 527                                           PC21 -0.144255806
```

```

## 516          PC10  0.136742404
## 513          PC7  -0.111478778
## 520          PC14  0.094619252
## 523          PC17  0.094399246
## 518          PC12  0.093177703
## 528          PC22  0.090081952
## 522          PC16 -0.080894981
## 521          PC15 -0.068847659
## 512          PC6   0.050496253
## 508          PC2  -0.047346914
## 519          PC13  0.034777362
## 510          PC4   0.034539592
## 525          PC19  0.033808265
## 515          PC9   0.032543201
## 511          PC5  -0.029694127
## 524          PC18 -0.016674981
## 517          PC11  0.016299366
## 514          PC8  -0.005797415
## 23           PC1   0.000000000
## 46           PC2   0.000000000
## 69           PC3   0.000000000
## 92           PC4   0.000000000
## 115          PC5   0.000000000
## 138          PC6   0.000000000
## 161          PC7   0.000000000
## 184          PC8   0.000000000
## 207          PC9   0.000000000
## 230          PC10  0.000000000
## 253          PC11  0.000000000
## 276          PC12  0.000000000
## 299          PC13  0.000000000
## 322          PC14  0.000000000
## 345          PC15  0.000000000
## 368          PC16  0.000000000
## 391          PC17  0.000000000
## 414          PC18  0.000000000
## 437          PC19  0.000000000
## 460          PC20  0.000000000
## 483          PC21  0.000000000
## 506          PC22  0.000000000
## 529 board_of_supervisors_district_5_dean_preston 0.000000000

```

Now let's just try a multiple linear regression on the top couple:

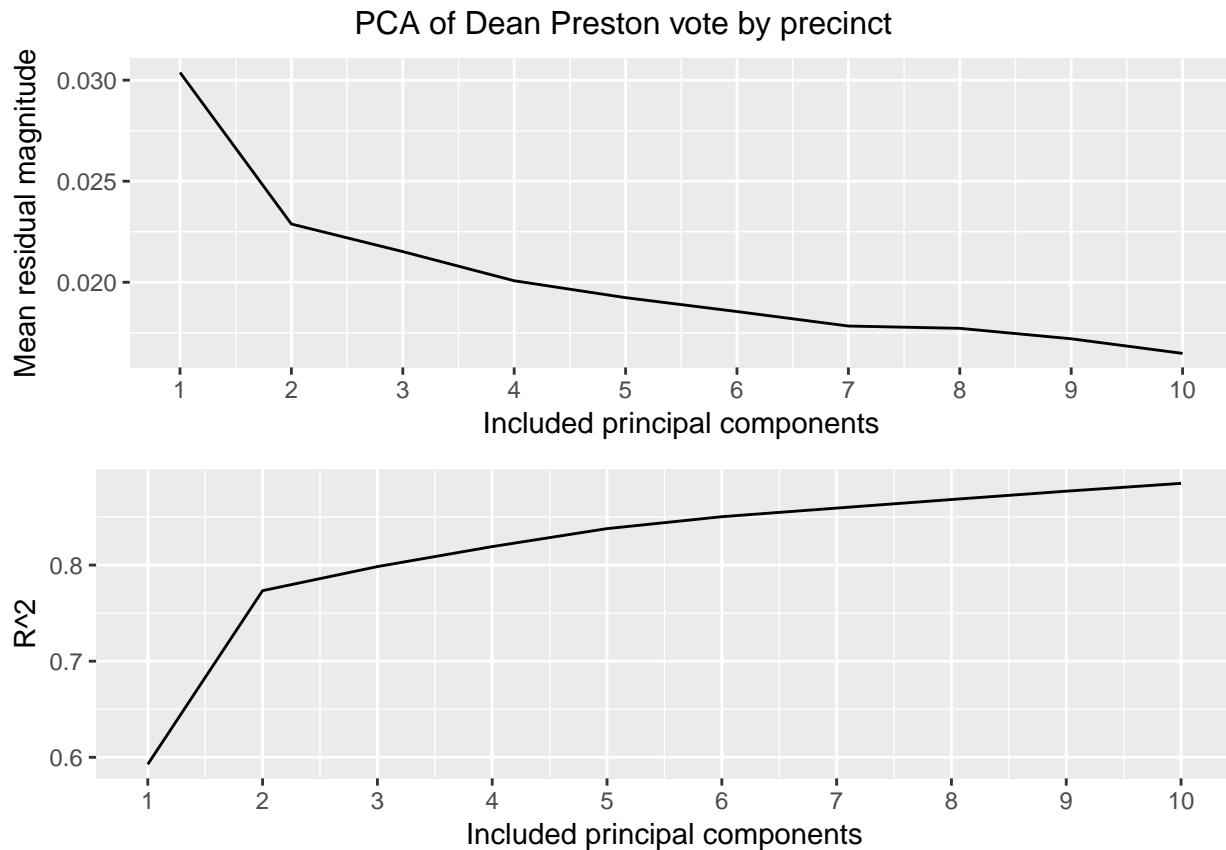
```

## Analysis of Variance Table
##
## Model 1: board_of_supervisors_district_5_dean_preston ~ PC1
## Model 2: board_of_supervisors_district_5_dean_preston ~ PC1 + PC3
## Model 3: board_of_supervisors_district_5_dean_preston ~ PC1 + PC3 + PC20
## Model 4: board_of_supervisors_district_5_dean_preston ~ PC1 + PC3 + PC20 +
##           PC21
## Model 5: board_of_supervisors_district_5_dean_preston ~ PC1 + PC3 + PC20 +
##           PC21 + PC10
## Model 6: board_of_supervisors_district_5_dean_preston ~ PC1 + PC3 + PC20 +
##           PC21 + PC10 + PC7

```

```
## Model 7: board_of_supervisors_district_5_dean_preston ~ PC1 + PC3 + PC20 +
## PC21 + PC10 + PC7 + PC14
## Model 8: board_of_supervisors_district_5_dean_preston ~ PC1 + PC3 + PC20 +
## PC21 + PC10 + PC7 + PC14 + PC17
## Model 9: board_of_supervisors_district_5_dean_preston ~ PC1 + PC3 + PC20 +
## PC21 + PC10 + PC7 + PC14 + PC17 + PC12
## Model 10: board_of_supervisors_district_5_dean_preston ~ PC1 + PC3 + PC20 +
## PC21 + PC10 + PC7 + PC14 + PC17 + PC12 + PC22
## Res.Df RSS Df Sum of Sq F Pr(>F)
## 1 65 0.093988
## 2 64 0.052294 1 0.041694 87.9952 4.403e-13 ***
## 3 63 0.046517 1 0.005777 12.1925 0.0009438 ***
## 4 62 0.041715 1 0.004802 10.1349 0.0023761 **
## 5 61 0.037400 1 0.004315 9.1066 0.0038279 **
## 6 60 0.034532 1 0.002868 6.0525 0.0169979 *
## 7 59 0.032466 1 0.002066 4.3602 0.0413472 *
## 8 58 0.030410 1 0.002056 4.3400 0.0418045 *
## 9 57 0.028407 1 0.002003 4.2284 0.0444247 *
## 10 56 0.026534 1 0.001873 3.9521 0.0517104 .
## ---
## Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
```

So even for something simple like multiple linear regression we don't need to include more than 9 PCs. Let's plot how adding more PCs affects the accuracy of our model:



In the interest of parsimony, let's restrict ourselves to the 3 most explanatory principle components, which in total explain 79.8% of the variation in Dean's percent vote by precinct. Let's go through them one by one; I'll attempt to explain what I think they represent using my qualitative knowledge of local politics/the

polarization around a given measure:

I'll now attempt to interpret these using a qualitative knowledge of city politics:

PC1 : General “Conservativeness”

```
##          local_measure_n_yes_of_accepted
##                               -0.1590757
##          local_measure_q_yes_of_accepted
##                               0.1574998
##  member_board_of_education_stevon_cook
##                               -0.1551521
##          local_measure_k_yes_of_accepted
##                               -0.1506544
##          local_measure_g_yes_of_accepted
##                               -0.1503145
##  state_proposition_62_yes_of_accepted
##                               -0.1502726
##  state_proposition_66_yes_of_accepted
##                               0.1495159
##  state_proposition_64_yes_of_accepted
##                               -0.1466200
##          local_measure_r_yes_of_accepted
##                               0.1451694
##          local_measure_p_yes_of_accepted
##                               0.1447655
##  state_proposition_57_yes_of_accepted
##                               -0.1447630
##          school_measure_b_yes_of_accepted
##                               -0.1431361
##          local_measure_w_yes_of_accepted
##                               -0.1428451
##  state_senate_district_11_jane_kim
##                               -0.1419237
##  member_community_college_board_tom_temprano
##                               -0.1404996
```

PC1 corresponds to something like **general “conservativeness”** - things like keeping the death penalty, not raising taxes, maintaining the criminalization of marijuana, voting for the nefarious Prop Q which was essentially a symbolic middle finger to homeless people, and, depressingly, emphatically not voting for the one black candidate for the board of education. This one’s a no-brainer, and it holds fairly well for all of the most important features in this PC.

PC3: Anti-Corporate/Anti-Establishment Sentiment

```
##          us_representative_district_12_preston_picus
##                               0.3519357
##          us_representative_district_12_nancy_pelosi
##                               -0.3196312
##          state_proposition_51_yes_of_accepted
##                               -0.3077057
##  member_community_college_board_alex_randolph
##                               -0.2262744
##          member_board_of_education_rachel_norton
```

```

##                                -0.2095583
## president_and_vice_president_gary_johnson__bill_weld
##                                0.1965036
##                                local_measure_t_yes_of_accepted
##                                0.1806424
##                                member_board_of_education_ian_kalin
##                                0.1798670
##                                member_board_of_education_jill_wynns
##                                -0.1681090
##                                school_measure_a_yes_of_accepted
##                                -0.1661394
##                                state_proposition_54_yes_of_accepted
##                                0.1655670
##                                state_proposition_60_yes_of_accepted
##                                -0.1578418
## president_and_vice_president_jill_stein__ajamu_baraka
##                                0.1550697
##                                member_community_college_board_amy_bacharach
##                                -0.1540507
##                                state_proposition_52_yes_of_accepted
##                                -0.1536686

```

PC5 is a little harder to interpret, as there are some conflicting components here as far as cleavage along traditional left/right political lines. At first one might think this is the progressive democrat contingent, since voting for Preston Picus and not for Nancy Pelosi were the single most important features of this PC, but the ballot measures (and positive coefficient for Gary Johnson) complicate that interpretation. I suspect this principal component represents something more like **anti-establishment sentiment**. From the perspective of candidates, we see that this PC voted for Dean Preston, Preston Picus, Jill Stein, and Gary Johnson, and emphatically NOT for London Breed, Nancy Pelosi, or Hillary Clinton, which can pretty uncontroversially be classified as an insurgent/establishment binary. However, from the point of view of ballot measures, this PC also voted against school bonds and condoms in porn; and for restrictions on campaign contributions from lobbyists and transparency in the state legislature. I believe this feature can then be interpreted as distrust of the establishment, both political and corporate, and especially the intersection of the two. These may be small-government folks, some libertarians (as we see from the Gary Johnson coefficient,) or just people whose defining political ideology is less a left/right perspective than it is an antagonistic stance towards what they may view as a corrupt political establishment.

***Note that the school board/community college members here were a little all over the place since you could vote for about half of the field, so I didn't belabor them, but they roughly match the above interpretation.*

PC20: Poorer, older folks

```

##                                state_proposition_54_yes_of_accepted
##                                0.3645306
##                                member_board_of_education_rob_geller
##                                0.3222220
##                                us_representative_district_12_preston_picus
##                                -0.2467094
##                                local_measure_e_yes_of_accepted
##                                -0.2449115
##                                local_measure_u_yes_of_accepted
##                                -0.2344685
##                                local_measure_c_yes_of_accepted
##                                0.2164574

```

```

## president_and_vice_president_writein_bernard_berniesanders__tu
## -0.2109391
## local_measure_q_yes_of_accepted
## -0.1905958
## state_proposition_56_yes_of_accepted
## 0.1904713
## member_board_of_education_ian_kalin
## 0.1745506
## member_board_of_education_phil_kim
## 0.1717663
## state_proposition_52_yes_of_accepted
## 0.1575712
## us_representative_district_12_nancy_pelosi
## 0.1462571
## district_measure_rr_yes_of_accepted
## -0.1453031
## local_measure_p_yes_of_accepted
## -0.1436568

```

This one also isn't nearly as easy to interpret as PC1, but I suspect this is something like **older, poorer, more socially moderate folks**; coupled with the fact that this feature correlates the third most strongly with whether or not a precinct voted for Dean (and correlates negatively,) I suspect this may also be capturing some information about race. Without being too on the nose, given the makeup of District 5 and knowing a bit about which neighborhoods voted which way, it wouldn't be unreasonable to guess that this corresponds to something like older black folks. This PC voted for things like condoms in porn and transparency in government, and against the anti-homelessness prop Q, but the defining characteristic of this PC was that it voted strongly for affordable housing at every opportunity. It also voted for Nancy Pelosi and London Breed over Preston Picus and Dean Preston, which leads me to believe that this is older, socially moderate folks.

A few things in this are hard to interpret, most notably the rejection of the tree ordinance and the BART bond. I can't explain the latter at all really, and I recall there being some very neighborhood-specific antipathy towards the tree ordinance, but I don't know where. The school board folks are a little weird here too, but Rob Geller in particular got such a small percent of the vote that it could just be a few anomalous precincts - this is only a population of 67 precincts, after all.

Why Orthogonality is Good

I mentioned earlier that I actually think orthogonality is a desirable property for the features we're creating/interpreting. PLSR and FA create features that can usually explain the same amount of variance as PCA with slightly fewer features, which is certainly an advantage, but orthogonality means that we can interpret the principal components *totally independently of each other*; e.g., varying PC3 would tell us how much more likely someone is to vote for Dean based on their anti-authoritarian impulses *while holding conservatism and status as elderly poor constant*. If these vectors weren't orthogonal, that wouldn't (necessarily) be the case. Practically, this means that we couldn't, e.g., measure a precinct's anti-authoritarian impulse as distinct from its conservatism; these two are probably somehow related, and unless the vectors we create to represent them are orthogonal, we can't separate them out completely.