Total number of iterations: 15000
Burn-in period: 5000
Thinning: 10
Kmax = 50
Dirichlet prior with gamma = 1/Kmax

Estimated posterior distribution of the number of clusters for each survey wave.								
ACS Survey Year	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**
2006-2010	0	0	0	**0.397**	0.383	0.158	0.055	0.007
2011-2015	0	0.001	0.279	**0.387**	0.206	0.074	0.039	0.014
2015-2019	0.124	0.132	**0.269**	0.258	0.137	0.063	0.014	0.003

Mixing weights

	2006-2010				2011-2015				2015-2019			
	Mean	**SD**	**2.50%**	**97.50%**	**Mean**	**SD**	**2.50%**	**97.50%**	**Mean**	**SD**	**2.50%**	**97.50%**
p.1	0.07	0.02	0.04	0.12	0.043	0.027	0.011	0.113	0.281	0.014	0.252	0.307
p.2	0.21	0.03	0.16	0.26	0.037	0.046	0.000	0.126	0.035	0.017	0.000	0.063
p.3	0.08	0.02	0.04	0.12	0.052	0.015	0.031	0.087	0.112	0.014	0.084	0.139
p.4	0.11	0.03	0.07	0.16	0.254	0.022	0.207	0.292	0.248	0.017	0.214	0.282
p.5	0.08	0.01	0.06	0.12	0.094	0.019	0.060	0.132	0.012	0.011	0.000	0.036
p.6	0.17	0.02	0.12	0.21	0.210	0.036	0.144	0.274	0.109	0.016	0.082	0.145
p.7	0.07	0.02	0.04	0.11	0.092	0.018	0.055	0.127	0.115	0.014	0.089	0.143
p.8	0.14	0.01	0.11	0.16	0.123	0.013	0.100	0.150	0.087	0.013	0.062	0.116
p.9	0.06	0.02	0.03	0.09	0.095	0.016	0.067	0.130				

			Assignment probability (ECR algorithm) *	
	N (original)	N (relabeled)	Mean (SD)	Median [Min, Max]
ACS 2006-2010				
Cluster 1	109		0.682 (0.162)	0.705 [0.336, 0.958]
Cluster 2	343		0.806 (0.173)	0.873 [0.175, 0.978]
Cluster 3	110		0.746 (0.176)	0.773 [0.161, 0.993]
Cluster 4	137		0.755 (0.133)	0.777 [0.472, 0.986]
Cluster 5	140		0.711 (0.194)	0.660 [0.343, 0.987]
Cluster 6	274		0.798 (0.181)	0.856 [0.167, 0.994]
Cluster 7	85		0.773 (0.180)	0.828 [0.372, 0.996]
Cluster 8	201		.916 (0.139	0.976 [0.302, 0.999]
Cluster 9	79		0.695 (0.176)	0.724 [0.381, 0.929]
ACS 2011-2015**				
Cluster 1	23	23	0.588 (0.105)	0.570 [0.425, 0.817]
Cluster 2	2	73	0.713 (0.189)	0.689 [0.333, 0.982]
Cluster 3	73	416	0.865 (0.170)	0.960 [0.242, 0.991]
Cluster 4	416	158	0.660 (0.205)	0.737 [0.247, 0.898]
Cluster 5	156	355	0.817 (0.190)	0.896 [0.218, 0.980]
Cluster 6	355	129	0.763 (0.148)	0.782 [0.297, 0.951]
Cluster 7	129	180	0.914 (0.130)	0.975 [0.400, 0.992]
Cluster 8	180	144	0.834 (0.179)	0.899 [0.288, 0.998]
Cluster 9	144			
ACS 2015-2019**				
Cluster 1	432	432	0.937 (0.136)	0.994 [0.223, 0.999]
Cluster 2	40	40	0.560 (0.140)	0.545 [0.310, 0.785]
Cluster 3	174	180	0.845 (0.180)	0.927 [0.289, 0.996]
Cluster 4	371	375	0.920 (0.134)	0.968 [0.219, 0.986]

Cluster 5	11	159	0.846 (0.163)	0.923 [0.277, 0.990]
Cluster 6	158	176	0.884 (0.148)	0.962 [0.351, 0.989]
Cluster 7	176	116	0.853 (0.170)	0.935 [0.329, 0.994]
Cluster 8	116			

N(original): Estimated number of observations per cluster conditionally on **mapK** (3 label switching algorithms); however, the model outputs the posterior mean of the probability of success per feature and cluster using the ECR algorithm.
N(relabeled): same as N(original), except for ACS 2011-2015 and 2015-2019 we relabeled clusters 2 and cluster 5. This was based on the second-highest assignment probability.
*Assignment probabilities after relabeling
** For ACS 2011-2015, Cts in cluster 2 moved to cluster 5, while Cts in cluster 5 in ACS 2015-2019 were re-clustered to clusters 3, 4 and 6.

Cluster descriptions for ACS 2006-2010

Cluster	Cluster descriptions and distribution of age across census tracts For this, we are also going to look at the distribution of age and race/ethnicity across census tracts within the clusters			
	Description	**Age distribution**	**Race/ethnicity composition of CTs in the cluster**	**Conclusion/Summary** ***Also looked at the distribution of language** ***all at the census tract level**
1	High success probabilities for: - Renter - White collar occupation - < HS - >= Bachelor's - TPPR Low house ownership, no vehicle, poverty line	Avg median age is 33.2. Higher average proportions in the age groups: - 20-24 - 25-34 - 35-44 - 45-54	- Lowest avg proportion of NHW compared to other clusters. Highest avg proportion of Hispanic or Latinos compared to other clusters. - Second highest avg proportion of NHB	Educated Low income (at least compared to the state median) Multi-lingual/multi-cultural (based on distribution of language spoken at home other than EN or speak EN not "very well" Household crowding (Crowding among housing units)
2	High success probabilities for: - Renter - TPPR - Lack of complete plumbing + < HS Low probabilities for all other variables ranging from 0.3-0.04.	Avg median age is 34.4. Higher average proportions in the age groups: - 25-34 - 35-44 - 45-54	- Second Highest avg proportion of Hispanic or Latinos compared to other clusters. - Highest avg proportion of NHB	Low education Low income Multi-lingual/multi-cultural (based on distribution of language spoken at home other than EN or speak EN not "very well" Household crowding
3	High success probabilities for: - Owner Medium probabilities for: - < HS - SNAP benefits - Female household	Avg median age is 41.4. Higher average proportions in the age groups: - 35-44 - 45-54	Not very diverse, on average the proportion of NHW is 85.4	Low income Female households Older than above
4	High success probabilities for: - Owner - >= Bachelors - >= HS - Median income - White collar occupation	Avg median age is 43.0. Higher average proportions in the age groups: - 35-44 - 45-54	Similar distribution to the above, majority NHW (89.6)	Older in comparison to previous cluster, but seem to be more affluent or higher SES level based on the avg proportion of house ownership.
5	High probabilities for: - Owner - >= HS - Median Income Low for:	Avg median age is 42.6 Higher average proportions in the age groups: - 35-44 - 45-54	Similar distribution to the above, majority NHW (93.1)	High income At least HS educated

	- >= Bachelor's degree - White collar occupation - Renter			
6	High probabilities for: - Owner - >= Bachelor's degree - >= HS - white collar occupation	Avg median age is 42.9 Higher average proportions in the age groups: - 35-44 - 45-54	Similar distribution to the above, majority NHW	Highly educated. Medium-high income House ownership
7	High probabilities for: - Renter - < HS - Female household - SNAP - Below poverty	Avg median age is 37.9. Higher average proportions in the age groups: - 25-34 - 35-44 - 45-54	Lower avg proportion of NHW compared to previous clusters except cluster 1 Decent avg proportion of NHB and Hisp	High unemployment (proportions compared to the median for the state) Low ed Female household Higher avg of gov assistantship (SNAP) Decent multi-language/ multi-culture BIG renters
8	High probabilities for: - Renter - >= Bachelor's degree - White collar occupation - >= HS - Median income - TPPR	Avg median age is 35.9. Higher average proportions in the age groups: - 25-34 - 35-44 - 45-54	Higher avg proportion of NHA than any other minority group	2nd highest renters Highly educated and occupation Medium-high income Multi-lingual (based on avg proportion of language spoken at home other than EN)
9	High probabilities for: - Owner - < HS - Median income - unemployment	Avg median age is 40.8. Higher average proportions in the age groups: - 25-34 - 35-44 - 45-54	majority NHW (84.9)	Low ed House ownership High unemployment proportions

For variables: lack of plumbing and two or more rooms, 0 means there is no lack and no households with two or more ppr, respectively.

Cluster descriptions for ACS 2011-2015

About the survey:

- population grew 3.5% from 2006-2010 to 2011-2015.
- The two tracts in cluster 2: 25013812902 (Census Tract 8129.02, Hampden County, Massachusetts) & 25021415102 (Census Tract 4151.02, Norfolk County, Massachusetts)
- Looking at these in previous ACS, they were classified as cluster 4 and cluster 8, respectively.
- https://www.census.gov/programs-surveys/acs/guidance/comparing-acs-data/2015/5-year-comparison.html
- **Change in geographic boundaries** - The 2006-2010 ACS 5-year estimates used legal boundaries as of January 1, 2010. The 2011-2015 ACS 5-year estimates use legal boundaries as of January 1, 2015.—I think this has been adjusted from what I've seen so far
- **Also changes in the questionnaire or coding—this is a strength of our study because we are looking at each survey separately!!**
- ACTION: Moved 2 census tracts from cluster 2 in 2011-2015 to cluster 5 based on second highest assignment probability

Cluster	Cluster descriptions and distribution of age across census tracts For this, we are also going to look at the distribution of age and race/ethnicity across census tracts within the clusters			
	Description	**Age distribution**	**Race/ethnicity composition of CTs in the cluster**	**Conclusion**
1	High success probabilities for: - Renter - Female household Medium probabilities for: - TPPR - < HS - Unemployment - Below poverty line	Avg median age is 40.4. Higher average proportions in the age groups: - 25-34 - 35-44 - 45-54	majority NHW, and not very diverse	Renters Female households Low education Crowded housing
~~2~~	~~Medium probabilities for all variables but highest for~~ ~~- >= HS~~ ~~- Owner~~ ~~- >=Bachelors~~ ~~- Median income~~	~~Avg median age is 41.6.~~ ~~Higher average proportions in the age groups:~~ ~~- 25-34~~ ~~- 35-44~~ ~~- 45-54~~	~~majority NHW, and not very diverse~~	~~Higher Ed~~ ~~high Income~~ ~~Note that there are only 2 census tracts in this cluster, and based on distribution of main variables I think they can be combined with cluster 6~~
3 2	High success probabilities for: - Owner - <HS - >= Bachelor's degree - < HS - Median income	Avg median age is 43.2. Same majority age groups as above	majority NHW, and not very diverse	House ownership High ed High income
4 3	High success probabilities for: - Renter - Unemployment - < HS - TPPR	Avg median age is 35.4. Same majority age groups as above	- Highest avg proportion of Hispanic or Latinos compared to other clusters. - Highest avg proportion of NHB	Low ed Crowded housing Low income Multi-language/multi-cultural (EN not very well and other language other than EN)

				Similar to clusters 1 &2 in 2006-2010 survey—further exploration through cross-tabulations
5 4	High probabilities for: - Owner - >= HS	Avg median age is 44.6. Same majority age groups as above	Similar distribution to the above, majority NHW (91.3)	At least HS educated. House ownership
6 5	High probabilities for: - Owner - >=bachelor's degree - White collar - >= HS	Avg median age is 44.4. Same majority age groups as above	Similar distribution to the above, majority NHW	Higher ed House ownership
7 6	High probabilities for: - >=Bachelor's degree - Renter - White collar occupation - < HS - TPPR	Avg median age is 35.5. Same majority age groups as above	2nd highest avg proportion of Hispanic or Latinos and NHB compared to other clusters.	Higher ed Renters Multi-lingual Crowding among housing units
8 7	High probabilities for: - Renter - >= Bachelor's degree - White collar occupation - >= HS - TPPR	Avg median age is 35.7. Same majority age groups as above	Higher avg proportion of NHA than any other minority group	Multi-lingual Crowding High education Med-high income
9 8	High probabilities for: - Owner - < HS	Avg median age is 42.6. Same majority age groups as above	majority NHW (82.5)	House ownership Low ed Low income

Cluster descriptions for ACS 2015-2019

Cluster	Cluster descriptions and distribution of age across census tracts. For this, we are also going to look at the distribution of age and race/ethnicity across census tracts within the clusters			
	Description	**Age distribution**	**Race/ethnicity composition of CTs in the cluster**	**Conclusion**
1	High success probabilities for: - Renter Medium probs for: - TPPR - <HS - Unemployment	Avg median age is 36.1 Higher average proportions in the age groups: - 25-34 - 35-44 - 45-54	- Highest avg proportion of Hispanic or Latinos compared to other clusters. - Highest avg proportion of NHB	Multi-cultural/ multi-lingual Renters Low education Low income
2	High success probabilities for: - Renter - TPPR - Lack of complete plumbing + < HS Low probabilities for all other variables ranging from 0.3-0.04.	Avg median age is 38.6 Higher average proportions in the age groups: - 20-24 - 25-34 - 35-44 - 45-54	- Second Highest avg proportion of Hispanic or Latinos and NHB compared to other clusters.	Multi-cultural Crowding among housing units Low education
3	High success probabilities for: - Owner - < HS Medium probabilities for: - Female household - Below poverty - unemployment	Avg median age is 43.7 Higher average proportions in the age groups: - 25-34 - 35-44 - 45-54	Clusters 3-7 have similar distributions the one thing to notice	House ownership Low education Low income
4	High success probabilities for: - Owner - >= Bachelors - >= HS - White collar occupation More affluent census tracts?	Avg median age is 44.6 Higher average proportions in the age groups: - 35-44 - 45-54	Majority NHW not much diversity	House ownership High education High income (similar to cluster 4 in 2006-2010) Affluent CTs
~~5~~	~~High probabilities for:~~ ~~- Owner~~ ~~- >= bachelor's~~ ~~- Female household~~ ~~- White collar occupation~~ ~~- Below poverty~~	~~Avg median age is 40.1~~ ~~Higher average proportions in the age groups:~~ ~~- 25-34~~ ~~- 35-44~~ ~~- 45-54~~	~~Decent proportion of NHB~~	~~Higher education~~ ~~Female households~~ ~~Only 11 Cts here and all have avg proportion below poverty line >= median value for the state.~~

6 5	High probabilities for: - Owner - >= HS Low for everything else	Avg median age is 46.7 Higher average proportions in the age groups: - 35-44 - 45-54	Majority NHW not much diversity	Not multi-lingual (based on distribution of language) House ownership At least HS education
7 6	High probabilities for: - >= Bachelors - White collar occupation - >= HS - Renter	Avg median age is 35.6 Higher average proportions in the age groups: - 20-24 - 25-34 - 35-44 - 45-54	Decent proportion of Hispanics	Renters High education Multi-lingual
8 7	High probabilities for: - Renter - >= Bachelor's degree - White collar occupation - < HS - Median income - TPPR	Avg median age is 35.8 Higher average proportions in the age groups: - 25-34 - 35-44 - 45-54	- Second Highest avg proportion of Hispanic or Latinos and NHB compared to other clusters.	Multi-lingual (similar distribution of language as cluster 1) Combination of high ed and < HS Crowding