

Run information:

	2006-2010	2011-2015	2015-2019
Number of parallel heated chains	4		
Swap acceptance rate	54%	56.8%	56.7%
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 (P (K = k data))									
ACS Survey Year	6	7	8	9	10	11	12	13	14
2006-2010	0	0	0.156	0.428[‡]	0.256	0.100	0.043	0.013	0.004
2011-2015	0	0.088	0.328	0.343[‡]	0.174	0.049	0.018	0	0
2015-2019	0.081	0.347[‡]	0.328	0.163	0.064	0.017	0	0	0
‡Most probable model									

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	0.2043	0.0175	0.1712	0.2404	0.1292	0.0176	0.1037	0.1893	0.2946	0.0138	0.2684	0.3216
p.2	0.1054	0.014	0.0774	0.1322	0.1035	0.0112	0.0823	0.1255	0.1033	0.0133	0.0782	0.1287
p.3	0.1126	0.0392	0	0.1666	0.1984	0.0178	0.1663	0.2366	0.0373	0.0276	0.0000	0.0873
p.4	0.1003	0.0132	0.0754	0.1266	0.264	0.0152	0.2334	0.2933	0.1129	0.0143	0.0857	0.1431
p.5	0.138	0.0136	0.1098	0.1636	0.1124	0.0156	0.0857	0.1462	0.1081	0.0405	0.0073	0.1969
p.6	0.1005	0.0146	0.0721	0.1315	0.0715	0.0221	0	0.1154	0.2420	0.0242	0.1996	0.2897
p.7	0.053	0.0107	0.0345	0.0741	0.0109	0.0184	0	0.0563	0.1018	0.0437	0.0350	0.2070
p.8	0.0284	0.0227	0	0.0829	0.0397	0.0109	0.0225	0.0667				
p.9	0.1573	0.0319	0.1044	0.2212	0.0703	0.0209	0	0.0958				

***Note: The range of the confidence intervals do not include zero, the percentile values are very small – close to zero that R rounds them.

Cluster descriptions for ACS 2006-2010

Cluster	Description—highlighting main drivers	Age distribution	Distribution of original variables across estimated clusters (average proportions)	Conclusion/Summary
1	<ul style="list-style-type: none"> - Below poverty - Renter-occupied housing - Crowded housing - NH black - Hispanic Latino - Unemployment - Working class - 	<p>Avg median age is 33.2.</p> <p>Higher average proportions in the age groups:</p> <ul style="list-style-type: none"> - 20-24 - 25-34 - 35-44 - 45-54 	<ul style="list-style-type: none"> - Low average median income - Low proportion of >=Bachelors - High proportion of >=HS - High proportion of renter-occupied housing - High proportion of working-class population - High female household - Compared to other clusters: <ul style="list-style-type: none"> o highest proportion of SNAP benefits o highest proportion of Hispanics o crowding o highest prop of no vehicle 	<p>Main drivers for this cluster seem to be below poverty line, renter occupied housing, crowding among housing units and decent mean posterior success probabilities for NH black and Hispanic</p> <p>Low ed, Low income, high working class, and high ethnic minority + high limited language proficiency</p>
2	<ul style="list-style-type: none"> -Below poverty - Owner occupied housing - Working class - < HS - Unemployment 	<p>Avg median age is 40.8</p> <p>Higher average proportions in the age groups:</p> <ul style="list-style-type: none"> - 25-34 - 35-44 - 45-54 	<ul style="list-style-type: none"> - Medium income (mean median income is 63200) - High proportion of >=HS edu - High proportion of owner occupied housing - Low ethnic minorities 	<p>Low education</p> <p>Medium income</p> <p>High household ownership</p> <p>Low multi-lingual/multi-cultural</p>
3	<ul style="list-style-type: none"> - Below poverty - >= Bachelors - Owner occupied - >= HS - Median income 	<p>Avg median age is 42.4</p> <p>Higher average proportions in the age groups:</p> <ul style="list-style-type: none"> - 35-44 - 45-54 	<ul style="list-style-type: none"> - High median income - high proportion of >=HS ed and decent for >= Bachelors - High owner occupied housing - 	<p>Low multi-lingual/low multi-cultural</p> <p>High income</p> <p>Medium education</p> <p>High household ownership</p> <p>Low unemployment (in comparison)</p>
4	<ul style="list-style-type: none"> - Below poverty - Owner-occupied - Working class - >= HS - Median income - 	<p>Avg median age is 43.1.</p> <p>Higher average proportions in the age groups:</p> <ul style="list-style-type: none"> - 35-44 - 45-54 	<ul style="list-style-type: none"> - High median income - high proportion of >=HS ed and decent for >= Bachelors (avg 30%) - High owner occupied housing - Working class - Low ethnic minority - 	<p>Medium education</p> <p>Medium income</p> <p>Low multi-lingual/low multi-cultural</p>
5	<ul style="list-style-type: none"> - Renter-occupied - >=Bachelors - >=HS - 2nd highest for Hispanic - 2nd highest for limited EN proficiency 	<p>Avg median age is 36.0</p> <p>Higher average proportions in the age groups:</p> <ul style="list-style-type: none"> - 25-34 	<ul style="list-style-type: none"> - High median income - high proportion of >=HS ed and decent for >= Bachelors - medium owner occupied housing - 2nd highest for no -vehicle 	<p>Medium education</p> <p>Medium income</p> <p>Low-med multi-lingual/low multi-cultural</p>

	<ul style="list-style-type: none"> - 3rd highest NH black 	<ul style="list-style-type: none"> - 35-44 - 45-54 	<ul style="list-style-type: none"> - Working class - 2nd Highest prop of NHA 	
6	<ul style="list-style-type: none"> - Renter occupied - Below poverty - Working class - Unemployment - < HS - Female household 	<p>Avg median age is 37.5</p> <p>Higher average proportions in the age groups:</p> <ul style="list-style-type: none"> - 25-34 - 35-44 - 45-54 	<ul style="list-style-type: none"> - Low avg median income - At least HS ed (low bachelor) - Similar distribution of renter occupied vs. owner occupied housing units - Decent avg proportion of Hispanics and NHB 	<p>Low ed</p> <p>Low income</p> <p>Med ethnic minority + limited language proficiency</p>
7	<ul style="list-style-type: none"> - Renter occupied - >=bachelors - < HS - NH Asian - NH Black - Crowded housing 	<p>Avg median age is 35.5</p> <p>Higher average proportions in the age groups:</p> <ul style="list-style-type: none"> - 25-34 - 35-44 - 45-54 	<ul style="list-style-type: none"> - Low avg median income - High prop of renter-occupied - 2nd Highest SNAP benefits - Similar to cluster 1 in terms of vehicle ownership - Medium proportions of ethnic minorities (highest for NHA) - 2nd highest avg proportion of limited EN proficiency compared to other clusters 	<p>High ed, Low income, Low household, and high ethnic minority + high limited language proficiency</p>
8	<ul style="list-style-type: none"> - Owner occupied - < HS - Median income - Oweber occupied - >= Bachelors (decent) 	<p>Avg median age is 41.2</p> <p>Higher average proportions in the age groups:</p> <ul style="list-style-type: none"> - 25-34 - 35-44 - 45-54 	<ul style="list-style-type: none"> - High median income - High education - High proportion of owner-occupied housing units - Decent proportion of Hispanics 	<p>Highly educated and occupation</p> <p>Medium-high income</p> <p>Low-med Multi-lingual (based on avg proportion of language spoken at home other than EN)</p>
9	<ul style="list-style-type: none"> - >= Bachelors - Owner occupied. - >=HS - Below poverty line <p>Low probs for everything else</p>	<p>Avg median age is 43.4</p> <p>Higher average proportions in the age groups:</p> <ul style="list-style-type: none"> - 35-44 - 45-54 	<ul style="list-style-type: none"> - Highest avg median income compared to all other clusters - High education - High proportion of owner occupied housing units 	<p>**compared to other clusters—this one seems to be the most “affluent/ less diverse”—see the heatmap-- more purple!</p> <p>High education, high income, high white collar occupations, less diverse in terms of ethnic minorities.</p>

For lack of plumbing, 0 means there is no lack.

Cluster descriptions for ACS 2011-2015

About the survey:

- population grew 3.5% from 2006-2010 to 2011-2015.
- <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

Cluster	Description—highlighting main drivers (>= 45)	Age distribution	Distribution of original variables across estimated clusters (average proportions)	Conclusion/Summary
1	<ul style="list-style-type: none"> - >= Bachelors - Renter-occupied - >= HS - NH black - Hispanic - Crowding 	Avg median age is 35.7 <ul style="list-style-type: none"> - 25-34 - 35-44 - 45-54 	<ul style="list-style-type: none"> - High proportion of HS or higher and bachelor's or higher - Higher proportion of renter occupied housing - Low working class - 2nd highest NH Asian 	High education Low working class Medium ethnic minorities + limited EN language proficiency
2	Owner occupied Working class < HS	Avg median age: 42.2 <ul style="list-style-type: none"> - 25-34 - 35-44 - 45-54 	<ul style="list-style-type: none"> - Low avg proportion of > = bachelors - High avg prop of owner-occupied housing units - High avg prop of working class - High avg prop of SNAP benefits 	At least HS ed Working class Low proportions of ethnic minorities
3	>= Bachelors Owner occupied. >= HS Below poverty	Avg median age: 44.1 <ul style="list-style-type: none"> - 35-44 - 45-54 	<ul style="list-style-type: none"> - high avg median income - high avg proportion of education for both >= HS and >= Bachelors - High avg prop of owner-occupied housing units - low proportions of ethnic minorities - higher avg proportion of non-working class 	Low proportions of ethnic minorities Highly educated and occupation High income
4	Renter occupied. Working class Crowded housing BPL NH black < HS	Avg median age: 34.7 <ul style="list-style-type: none"> - 25-34 - 35-44 - 45-54 	<ul style="list-style-type: none"> - Low average median income - Higher avg proportion of female households compared to other clusters. - High avg proportion of no vehicle in household - High avg proportion of Hispanic - High avg proportion of NH black - High avg prop of limited EN language proficiency - High avg prop of working class 	Low ed, Low income, working class, and high ethnic minority + high limited language proficiency (multi-cultural/multi-lingual)

			<ul style="list-style-type: none"> - Lowest avg proportion of >= HS and >= Bachelors compared to other clusters - High avg proportion of SNAP benefits - High avg prop of crowding 	
5	Owner occupied >= HS Working class	Avg median age: 46.4 - 35-44 - 45-54	<ul style="list-style-type: none"> - High avg proportion of >= HS + decent proportion of >= bachelors - High avg prop of owner-occupied housing units - Medium-high avg proportion of working class - Low avg proportions of ethnic minorities 	Less diverse in terms of proportions of ethnic minorities Medium education Medium income Medium education
6	Median income >= HS Owner occupied >= Bachelors	Avg median age: 42.6 - 25-34 - 35-44 - 45-54	<ul style="list-style-type: none"> - High avg medium income - High avg proportion of >= HS + >= bachelors - High avg prop of owner-occupied housing units - Low avg proportions of ethnic minorities 	High income High education Low ethnic minorities
7	Mostly medium to low probabilities Highest for < HS Owner occupied housing			
8	-Female household Unemployment <HS Working class Renter-occupied housing unit	Avg median age: 40.6 - 25-34 - 35-44 - 45-54 - Similar distribution	<ul style="list-style-type: none"> - Not very high avg medium income - Lower avg proportion of >= HS and >= Bachelors compared to other clusters - 3rd highest avg proportion of SNAP benefit - 	Medium income Medium education
9	< HS Crowded housing Renter occupied. >= Bachelors Below 150% poverty	Avg median age: 36.0 - 25-34 (majority) - 35-44 - 45-54	<ul style="list-style-type: none"> - Not very high avg medium income - 2nd highest avg proportion of SNAP benefit - High avg proportions of ethnic minorities and limited EN language proficiency 	Medium income High ethnic + limited EN proficiency (multi-cultural/multi-lingual) High education

Cluster descriptions for ACS 2015-2019

Cluster	Description—highlighting main drivers	Age distribution	Distribution of original variables across estimated clusters (average proportions)	Conclusion/Summary
1		<p>Avg median age is 35.9 Higher average proportions in the age groups:</p> <ul style="list-style-type: none"> - 25-34 - 35-44 - 45-54 	<ul style="list-style-type: none"> - Low avg median income - High avg proportion of renter-occupied housing units - Highest avg proportion of working class and unemployment - high avg proportion of Hispanic and NH black + limited EN language proficiency - At least HS educated. - high avg proportion of female household - High avg proportion of households with no vehicle - High avg proportion of SNAP benefits - 	<p>Multi-cultural/ multi-lingual Renters Low education Low income</p>
2		<p>Avg median age is 43.1 Higher average proportions in the age groups:</p> <ul style="list-style-type: none"> - 25-34 - 35-44 - 45-54 	<ul style="list-style-type: none"> - At least HS educated. - High avg proportion of owner-occupied housing units - High avg proportion of working class - 	
3		<p>Avg median age is 42.8 Higher average proportions in the age groups:</p> <ul style="list-style-type: none"> - 25-34 - 35-44 - 45-54 	<ul style="list-style-type: none"> - High proportion of >= HS and >= bachelors degree - High avg proportion of owner-occupied housing units 	High education
4		<p>Avg median age is 46.5 Higher average proportions in the age groups:</p> <ul style="list-style-type: none"> - 25-34 - 35-44 - 45-54 	<ul style="list-style-type: none"> - High avg proportion of owner-occupied housing units - At least HS education - High avg proportion of working class - 	Medium education
5		<p>Avg median age is 35.5 Higher average proportions in the age groups:</p> <ul style="list-style-type: none"> - 25-34 	<ul style="list-style-type: none"> - High avg median income - High avg proportion of >= HS and >= bachelor's degree 	

		<ul style="list-style-type: none"> - 35-44 45-54 	<ul style="list-style-type: none"> - High avg proportion of households with no vehicle - High proportion of renter occupied housing units - High avg proportion of NH Asians 	
6		<p>Avg median age is 44.8</p> <p>Higher average proportions in the age groups:</p> <ul style="list-style-type: none"> - 25-34 - 35-44 45-54 	<ul style="list-style-type: none"> - High avg proportion of owner-occupied housing units - High avg proportions of ethnic minorities 	
7		<p>Avg median age is 36.2</p> <p>Higher average proportions in the age groups:</p> <ul style="list-style-type: none"> - 25-34 - 35-44 45-54 	<ul style="list-style-type: none"> - High avg proportion of limited EN language proficiency - High avg proportion of SNAP benefits - 	

Relabeling clusters to match a reference dataset in this case we use 2006-2010.

Original

acs15									
acs10	cluster1	cluster2	cluster3	cluster4	cluster5	cluster6	cluster7	cluster8	
cluster1	3	0	38	2	1	44	20	1	
cluster2	6	1	289	3	2	26	9	7	
cluster3	1	5	16	24	4	1	0	59	
cluster4	1	24	1	12	85	2	7	5	
cluster5	3	12	1	66	30	2	2	24	
cluster6	1	15	4	27	213	4	9	1	
cluster7	3	1	55	3	2	11	3	7	
cluster8	5	7	7	3	16	35	128	0	
cluster9	0	8	5	18	2	4	2	40	

After relabeling based on cluster description similarities

acs15									
acs10	cluster1	cluster2	cluster3	cluster4	cluster5	cluster6	cluster7	cluster8	
cluster1	44	38	1	0	2	1	3	20	
cluster2	26	289	7	1	3	2	6	9	
cluster3	1	16	59	5	24	4	1	0	
cluster4	2	1	5	24	12	85	1	7	
cluster5	2	1	24	12	66	30	3	2	
cluster6	4	4	1	15	27	213	1	9	
cluster7	11	55	7	1	3	2	3	3	
cluster8	35	7	0	7	3	16	5	128	
cluster9	4	5	40	8	18	2	0	2	

Original

		acs19						
acs15		cluster1	cluster2	cluster3	cluster4	cluster5	cluster6	cluster7
cluster1		21	8	3	3	3	26	65
cluster2		362	12	15	2	2	5	18
cluster3		17	2	98	3	23	0	1
cluster4		2	9	19	28	10	3	2
cluster5		9	2	34	27	84	1	1
cluster6		2	5	8	296	33	10	1
cluster7		12	0	3	0	1	2	5
cluster8		7	2	0	16	3	129	23