Output Cluster Subset Mixed Effects

Tuesday, December 15, 2020   3:10 PM

cluster==9 | cluster== 26| cluster== 27 | cluster== 32 | cluster== 34| cluster== 35 | cluster== 38| cluster== 39

Mixed Effects with age, gender, hand, region
With no update in iterations and burn iterations

```
bpnme(pred.I = y ~ age + gender + hand + region + (1 | writer),
    data = data)
MCMC:
iterations = 1000
burn-in = 1
lag = 1
Model Fit:
        Statistic Parameters
lppd    -112127.7    18.0000
DIC      223983.2  -435.6231
DIC.alt  253728.6 14437.0781
WAIC     224582.2   163.4560
WAIC2    224581.3   162.9667
Fixed Effects
Linear Coefficients
Component I:
```

	mean	mode	sd	LB HPD	UB HPD
(Intercept)	-0.63064067	-0.590252065	0.1548639	-0.94680194	-0.3371625
age25-40	0.14101927	0.151852622	0.1399286	-0.12979660	0.4164593
age41-60	0.31549234	0.276431852	0.1205127	0.06377658	0.5276751
age61+	0.13568685	0.149380510	0.1818880	-0.24525644	0.4654883
gendermale	0.12541713	0.134299990	0.1010154	-0.06700077	0.3159449
handright	0.04855560	-0.008478975	0.1463736	-0.20816870	0.3616082
regionnortheast	0.35065799	0.124896533	0.4327928	-0.45049414	1.1356224
regionsouth	0.08162525	0.066169472	0.1574940	-0.23860944	0.3725339
regionwest	0.16871817	0.208032502	0.2719039	-0.35979675	0.6688434

```
Component II:
```

	mean	mode	sd	LB HPD	UB HPD
(Intercept)	-0.12504344	-0.01340112	0.1983193	-0.5374892	0.2402775
age25-40	-0.03295844	-0.09391495	0.1785174	-0.3591061	0.3137937
age41-60	0.59068571	0.59370718	0.1588348	0.2693564	0.8834539
age61+	0.82985124	0.83555691	0.2468717	0.3185424	1.2808079
gendermale	0.15435739	0.11800617	0.1345911	-0.1050496	0.4252006
handright	0.21873637	0.18793679	0.1922664	-0.1456279	0.5939704
regionnortheast	-0.52752868	-0.60851653	0.5837617	-1.6968981	0.5969871
regionsouth	0.27997329	0.23475620	0.2070883	-0.1254126	0.6769662
regionwest	-0.05805370	-0.20796375	0.3589656	-0.7331284	0.6834876

```
Circular Coefficients
Continuous variables:
[1] "There are no numeric predictors in the model"
Categorical variables:
Means:
```

	mean	mode	sd	LB	UB
(Intercept)	-2.9508919	-2.992840	0.3061670	2.75009136	3.9336942
age25-40	-2.8482403	-2.644815	0.4268469	2.59517891	4.2480752
age41-60	2.1927769	2.085891	0.3434775	1.45917323	2.8326646

	mean	mode	sd	LB	UB
age61+	2.2065162	2.139813	0.3105378	1.54857256	2.8250391
gendermale	3.0884281	2.974599	0.4037416	2.32996798	3.8862744
handright	2.9858492	2.947962	0.2261868	2.54624254	3.4182228
regionnortheast	-2.0200840	-1.926612	0.8849846	1.98493509	6.2416343
regionsouth	2.8854475	2.630530	0.5227693	1.83545014	3.8071847
regionwest	-2.8062450	-2.509707	0.8477836	1.77920508	5.0747449
age25-40age41-60	1.9935265	1.740951	0.6309582	0.81486644	3.6431289
age25-40age61+	2.0908506	1.965640	0.4535426	1.23639841	2.9850754
age25-40gendermale	-3.1324975	3.084819	0.6353140	1.76952253	4.2123490
age25-40handright	3.0083835	3.000075	0.3503200	2.39272864	3.7504574
age25-40regionnortheast	-1.7967417	-1.756179	0.9453667	2.01479539	0.3836684
age25-40regionsouth	2.8715160	2.843692	0.6369075	1.82034672	4.2783419
age25-40regionwest	-2.5983127	-2.555372	0.9912103	1.40535412	5.6174700
age41-60age61+	1.7136734	1.693755	0.2115874	1.33141747	2.1727356
age41-60gendermale	1.8827823	1.785471	0.3242852	1.28672886	2.5046512
age41-60handright	1.9452215	1.941186	0.1287225	1.68653310	2.1874461
age41-60regionnortheast	-0.9217061	-1.696715	2.3236722	-2.55604579	3.2002848
age41-60regionsouth	1.8915371	1.762214	0.3493966	1.24747753	2.6189030
age41-60regionwest	1.9520927	1.743356	1.0220099	0.03515054	4.9474646
age61+gendermale	1.9953358	1.823302	0.3009157	1.48979851	2.6693515
age61+handright	2.0284576	1.954639	0.1801767	1.68104367	2.3910488
age61+regionnortheast	2.2897829	1.356743	1.6568229	0.63886771	6.1553181
age61+regionsouth	1.9855683	1.916540	0.3101355	1.36589676	2.5994236
age61+regionwest	2.0595274	1.984934	0.6326297	0.80360417	3.5665729
gendermalehandright	2.6558276	2.720706	0.2592715	2.17366161	3.2007140
gendermaleregionnortheast	-1.9090221	-1.979718	1.1143237	1.39919571	0.1788808
gendermaleregionsouth	2.5474582	2.332366	0.5791616	1.56817681	3.8822994
gendermaleregionwest	-3.0840113	-2.541720	1.0944159	1.04522578	5.2746877
handrightregionnortheast	-2.1294793	-1.883982	1.0978434	1.25840448	6.2014098
handrightregionsouth	2.5257623	2.447232	0.3554549	1.86624697	3.2314484
handrightregionwest	3.0626908	3.067555	0.8729740	1.46377243	4.8129899
regionnortheastregionsouth	-2.1318367	-1.692209	1.2817581	0.50379391	5.8971740
regionnortheastregionwest	-1.7531433	-1.712700	1.0344910	1.55531000	0.2742676
regionsouthregionwest	2.9219616	2.352904	1.1020269	0.97452537	5.3925486

Differences:

	mean	mode	sd	LB	UB
age25-40	-0.1013187	-0.23542074	0.3368646	-0.75102522	0.5576255
age41-60	1.1286207	1.18460332	0.3713544	0.48564327	1.8815112
age61+	1.1188332	0.96157106	0.3705793	0.43663391	1.8697470
gendermale	0.2415314	0.16859914	0.2788939	-0.28644652	0.8089108
handright	0.3453772	0.27574933	0.3076327	-0.23855014	0.9565989
regionnortheast	-0.8817743	-1.04317924	0.8758421	-3.04887045	1.0936653
regionsouth	0.4307834	0.40204288	0.4234617	-0.36462393	1.3225519
regionwest	-0.1380678	-0.28979532	0.7407568	-1.53504600	1.5428737
age25-40age41-60	1.3089724	1.24798916	0.6751992	-0.37635639	2.6261403
age25-40age61+	1.2292491	1.28224464	0.5182225	0.25474089	2.2103134
age25-40gendermale	0.1745194	0.04596664	0.5856577	-0.85365468	1.4447121
age25-40handright	0.3241015	0.36960563	0.4765796	-0.59880011	1.2494279
age25-40regionnortheast	-1.1107129	-1.04016446	0.9670744	2.86974936	1.2210251
age25-40regionsouth	0.4377113	0.41999467	0.5744658	-0.64152983	1.5813623
age25-40regionwest	-0.3314694	-0.36760601	0.9170070	-2.40504700	1.7692726
age41-60age61+	1.6157685	1.68294951	0.3745161	0.86626669	2.3259511
age41-60gendermale	1.4403217	1.44379891	0.4278751	0.70169352	2.2829554
age41-60handright	1.3874650	1.31897020	0.3321960	0.70913049	2.0220098
age41-60regionnortheast	-1.3511272	-1.23077276	2.3458829	-2.91273024	2.9152546
age41-60regionsouth	1.4272278	1.41524234	0.4513644	0.58126801	2.3091031
age41-60regionwest	1.2835214	1.10507804	1.0413807	-1.46442586	3.5789463
age61+gendermale	1.3303352	1.15552882	0.4083833	0.59632064	2.1457648
age61+handright	1.3038522	1.30595954	0.3536098	0.66522110	2.0381218

	mean	mode	sd	LB HPD	UB HPD
age61+regionnortheast	0.8963184	0.79873884	1.6324217	-2.75593208	2.8099105
age61+regionsouth	1.3394716	1.16190106	0.4186658	0.59292516	2.1877924
age61+regionwest	1.2367729	1.10925271	0.6731280	-0.18662917	2.6924237
gendermalehandright	0.6753370	0.73088232	0.3873545	-0.16457672	1.3713008
gendermaleregionnortheast	-0.9727611	-1.02824628	1.1136587	2.85955773	1.6110026
gendermaleregionsouth	0.7572188	0.68780195	0.5513745	-0.29101292	1.9200828
gendermaleregionwest	0.1131528	0.43047196	0.9985816	-1.81655034	2.3450398
handrightregionnortheast	-0.8176430	-1.07281480	1.1228880	-2.84481449	2.0973345
handrightregionsouth	0.8011227	0.82010147	0.4348868	-0.03784047	1.6970468
handrightregionwest	0.2493328	0.24995050	0.8648638	-1.24085858	2.2657221
regionnortheastregionsouth	-0.7432431	-0.88646286	1.2404788	2.95354570	1.9050963
regionnortheastregionwest	-1.1266678	-0.87435040	1.0360243	2.66059081	1.4105049
regionsouthregionwest	0.3479779	0.11831805	1.0125051	-1.69384899	2.5807984

Random Effects
Linear Coefficients
Component I:

	mean	mode	sd	LB HPD	UB HPD
RI	0.1865287	0.1861616	0.03196002	0.1333736	0.2553326

Component II:

	mean	mode	sd	LB HPD	UB HPD
RI	0.2996953	0.3083109	0.05208441	0.1999942	0.3960412

Circular Coefficients

	mean	mode	sd	LB	UB
RI	0.7102501	0.7300942	0.08733643	0.5279741	0.8582679

Mixed Effect of writer and cluster with age, gender, hand, region With no update in iterations and burn iterations

```
bpnme(pred.I = y ~ age + gender + hand + region + (1 | writer),
    data = data, its = 5000, burn = 500)
MCMC:
iterations = 5000
burn-in = 500
lag = 1
Model Fit:
```

```
       Statistic Parameters
lppd    -112127.3    18.0000
DIC      223796.6  -612.7076
DIC.alt  225316.8   147.3671
WAIC     224564.1   154.7351
WAIC2    224564.5   154.9210
```

Fixed Effects
Linear Coefficients
Component I:

	mean	mode	sd	LB HPD	UB HPD
(Intercept)	-0.63692852	-0.57220774	0.1609775	-0.97184407	-0.3359121
age25-40	0.14259344	0.15431054	0.1405194	-0.14170758	0.4117193
age41-60	0.31959330	0.34023207	0.1277425	0.07598614	0.5765097
age61+	0.13260322	0.13283636	0.1958990	-0.25638130	0.5110100
gendermale	0.12765523	0.11398776	0.1061401	-0.07164240	0.3468243
handright	0.05176783	0.08550501	0.1499773	-0.24282489	0.3476461
regionnortheast	0.34469138	0.23802341	0.4512817	-0.50474689	1.2742327
regionsouth	0.08103781	0.08831585	0.1621288	-0.23080391	0.4156381
regionwest	0.15759628	0.10547673	0.2739744	-0.40165711	0.6769838

Component II:

	mean	mode	sd	LB HPD	UB HPD
(Intercept)	-0.12249424	-0.12868223	0.2061088	-0.55674842	0.2583600
age25-40	-0.03646391	-0.06753148	0.1786369	-0.37512080	0.3312186
age41-60	0.58380607	0.56581142	0.1589831	0.28558167	0.9096432
age61+	0.80418016	0.80856883	0.2461413	0.33730892	1.3051847
gendermale	0.14966951	0.18423369	0.1320403	-0.09718424	0.4189485
handright	0.22899013	0.19413505	0.1916502	-0.14748169	0.6070761
regionnortheast	-0.55658796	-0.48119309	0.5552400	-1.62521297	0.5638427
regionsouth	0.25559206	0.23435983	0.2024185	-0.13629799	0.6626655
regionwest	-0.06375983	-0.06521939	0.3418985	-0.73606739	0.6102296

Circular Coefficients
Continuous variables:
[1] "There are no numeric predictors in the model"
Categorical variables:
Means:

	mean	mode	sd	LB	UB
(Intercept)	-2.959140	-2.982132	0.3156204	2.68726317	3.92120581
age25-40	-2.844637	-2.792053	0.4287819	2.58819408	4.24567283
age41-60	2.196881	2.058661	0.3528605	1.50991749	2.89605436
age61+	2.228406	2.238615	0.3274418	1.63321308	2.89805323
gendermale	3.090840	3.092283	0.4082061	2.27848620	3.85572077
handright	2.963897	2.951155	0.2269720	2.52131880	3.40629816
regionnortheast	-2.014096	-1.819181	0.8513878	1.83492362	5.95819144
regionsouth	2.915736	2.824306	0.4997137	2.04034986	3.99104373
regionwest	-2.799394	-2.759869	0.8243126	1.65974529	5.13551118
age25-40age41-60	1.991890	1.947988	0.6472588	0.54521048	3.44227840
age25-40age61+	2.108915	2.060665	0.4824283	1.15963465	3.11637718
age25-40gendermale	-3.111193	3.065939	0.6395022	1.93960977	4.42915207
age25-40handright	2.990123	2.937431	0.3515535	2.27096328	3.65151114
age25-40regionnortheast	-1.797358	-1.702769	0.8941872	1.72673602	6.26054743
age25-40regionsouth	2.923151	2.978689	0.6385363	1.71693453	4.19994960
age25-40regionwest	-2.603311	-2.244990	0.9667785	1.38664779	5.61251674
age41-60age61+	1.718806	1.712453	0.2255600	1.28071800	2.16398035
age41-60gendermale	1.883247	1.850204	0.3224356	1.26349439	2.51329424
age41-60handright	1.940966	1.927516	0.1335681	1.68901825	2.21190915
age41-60regionnortheast	-1.208173	-1.358402	2.1490270	3.11742748	2.66246779
age41-60regionsouth	1.906673	1.787358	0.3599853	1.21395696	2.65140922
age41-60regionwest	1.980586	1.695429	0.9913210	0.08262524	4.74886780
age61+gendermale	2.009062	1.978033	0.3012038	1.43102192	2.61101450

```
age61+handright              2.039020   1.997181 0.1888135   1.66360020 2.40862497
age61+regionnortheast        2.497142   1.570149 1.7141913  -0.20861273 5.39026063
age61+regionsouth            2.011426   1.974164 0.3270663   1.40549220 2.68653638
age61+regionwest             2.113941   2.061100 0.6353091   0.90345827 3.69534128
gendermalehandright          2.640350   2.635346 0.2589480   2.16279644 3.16920659
gendermaleregionnortheast   -1.895105  -1.689792 1.0566063   1.58593086 0.33624794
gendermaleregionsouth        2.585385   2.389060 0.5827064   1.50606694 3.79174695
gendermaleregionwest        -3.048828   3.172198 1.0616987   0.87469363 5.34183767
handrightregionnortheast    -2.105027  -1.721551 1.0884903   1.42075281 0.02899690
handrightregionsouth         2.535629   2.424305 0.3579771   1.88573504 3.28923552
handrightregionwest          3.047588   3.186212 0.8705764   1.38655338 4.95438371
regionnortheastregionsouth  -2.082176  -2.088017 1.2173278   1.10979820 0.09450833
regionnortheastregionwest   -1.763451  -1.735485 0.9636362   2.15678742 0.64478867
regionsouthregionwest        2.977490   2.770340 1.0727106   0.59704470 5.09061988
```
Differences:
```
                                  mean        mode        sd          LB        UB
age25-40                    -0.11163997 -0.09931404 0.3405221 -0.82163518 0.5360725
age41-60                     1.11436913  1.06113624 0.3784001  0.48891119 1.9495389
age61+                       1.08690863  1.12982106 0.3792878  0.37887538 1.8439213
gendermale                   0.23027138  0.18155541 0.2681495 -0.26814550 0.7636661
handright                    0.35888072  0.31568664 0.3068040 -0.26383761 0.9511077
regionnortheast             -0.89835396 -0.93884195 0.8527702 -2.80227316 1.3084658
regionsouth                  0.39892380  0.36377984 0.3955411 -0.33521019 1.2258894
regionwest                  -0.14052683 -0.10002004 0.7206825 -1.65276386 1.5580805
age25-40age41-60             1.30482949  1.40619457 0.6942206 -0.26332002 2.7858042
age25-40age61+               1.20147625  1.15946280 0.5422423  0.14535430 2.2991489
age25-40gendermale           0.14791731  0.22208191 0.5869364 -1.01375739 1.3767440
age25-40handright            0.33398266  0.41970607 0.4757656 -0.63507126 1.2250189
age25-40regionnortheast     -1.12098908 -1.15845318 0.9234710  2.99910097 1.1970143
age25-40regionsouth          0.38713573  0.49309340 0.5776519 -0.72319904 1.6338278
age25-40regionwest          -0.31541510 -0.24514380 0.8947071 -2.39818312 1.7544914
age41-60age61+               1.60203344  1.55762722 0.3875505  0.84495949 2.3549432
age41-60gendermale           1.43167397  1.45201754 0.4288494  0.65006235 2.3184770
age41-60handright            1.38310444  1.37750122 0.3443845  0.67897012 2.0228127
age41-60regionnortheast     -1.28045099 -1.30673800 2.1737905 -2.71382397 3.1588227
age41-60regionsouth          1.40593890  1.35570570 0.4487161  0.58420791 2.3493085
age41-60regionwest           1.25321592  1.47103825 0.9947934 -1.29904410 3.3307497
age61+gendermale             1.30816236  1.15591739 0.4058922  0.54986404 2.1386836
age61+handright              1.28441966  1.22987272 0.3646888  0.56208378 1.9832158
age61+regionnortheast        0.69767942  1.00085318 1.6531217 -2.12934895 3.4957457
age61+regionsouth            1.30463009  1.33200935 0.4168418  0.55685094 2.1787073
age61+regionwest             1.17478572  1.03666880 0.6507494 -0.30981068 2.5138535
gendermalehandright          0.68233709  0.70719994 0.3886147 -0.10670037 1.4160645
gendermaleregionnortheast   -0.99791953 -1.21056371 1.0604342  3.12252737 1.7992983
gendermaleregionsouth        0.71757728  0.63336658 0.5443760 -0.42269270 1.7645372
gendermaleregionwest         0.09059301  0.01199962 0.9592983 -2.01567886 2.2418399
handrightregionnortheast    -0.83295562 -0.93013046 1.1133470 -2.95190767 2.0484930
handrightregionsouth         0.78605977  0.91376758 0.4387667 -0.04407142 1.6803754
handrightregionwest          0.27051316  0.31164399 0.8608556 -1.62101127 2.0307267
regionnortheastregionsouth  -0.79219278 -0.79722125 1.1954383  3.09810340 2.0454272
regionnortheastregionwest   -1.12679883 -0.91218361 0.9832276  3.00238964 1.5001691
regionsouthregionwest        0.32090373  0.24241408 0.9785832 -1.66817361 2.6355050
```
Random Effects
Linear Coefficients
Component I:
```
      mean      mode       sd      LB HPD    UB HPD
RI 0.1897044 0.1817108 0.03366723 0.1312294 0.2571629
```
Component II:
```
      mean      mode        sd      LB HPD    UB HPD
```

```
RI 0.2991127 0.2791273 0.05246016 0.2097673 0.4091754
Circular Coefficients
mean       mode        sd          LB         UB
RI 0.7119536 0.7588962 0.09010322 0.5342104 0.8621661
```