

R version 4.1.2 (2021-11-01) -- "Bird Hippie"  
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Platform: x86\_64-w64-mingw32/x64 (64-bit)

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```
> summary(training_S.Eng, prob=0.89)
Family: categorical
Links: mudress = logit; muface = logit; mufleece = logit; mufoot = logit; mugoat = logit; mugoose = logit; mukit = logit; mulot = log
it; mumouth = logit; munurse = logit; mupalm = logit; muprice = logit; mustrut = logit; muthought = logit; mutrap = logit
Formula: vowel_name ~ duration_logRS + F1_DCT0RS + F1_DCT1RS + F1_DCT2RS + F2_DCT0RS + F2_DCT1RS + F2_DCT2RS + F3_DCT0RS + F3_DCT1RS +
F3_DCT2RS
Data: S.Eng (Number of observations: 800)
Draws: 4 chains, each with iter = 4000; warmup = 1000; thin = 1;
       total post-warmup draws = 12000
```

Population-Level Effects:

	Estimate	Est.Error	1-89% CI	u-89% CI	Rhat	Bulk_ESS	Tail_ESS
mudress_Intercept	-1.54	2.64	-5.71	2.64	1.00	3621	4672
muface_Intercept	-21.61	9.28	-37.98	-8.82	1.00	2629	3945
mufleece_Intercept	-47.45	13.97	-71.36	-28.11	1.00	2737	3745
mufoot_Intercept	0.41	2.41	-3.38	4.22	1.00	3458	4520
mugoat_Intercept	3.87	1.96	0.99	7.13	1.00	3157	3469
mugoose_Intercept	-20.98	9.98	-38.40	-7.82	1.00	2532	3428
mukit_Intercept	-4.14	3.16	-9.27	0.77	1.00	3196	4858
mulot_Intercept	-22.75	9.25	-38.98	-10.46	1.00	3149	4114
mumouth_Intercept	-31.86	13.24	-55.05	-14.56	1.00	3137	4029
munurse_Intercept	1.42	2.74	-2.97	5.68	1.00	3811	4017
mupalm_Intercept	-28.60	13.11	-52.18	-11.16	1.00	2422	3614
muprice_Intercept	-0.60	2.49	-4.70	3.20	1.00	5262	6965
mustrut_Intercept	-0.91	2.86	-5.50	3.59	1.00	5004	6508
muthought_Intercept	-96.01	80.92	-247.14	-31.23	1.00	1190	1181
mutrap_Intercept	-15.75	4.85	-24.08	-8.68	1.00	4981	7079
mudress_duration_logRS	-15.14	6.35	-25.62	-5.34	1.00	2121	4268
mudress_F1_DCT0RS	42.64	10.07	27.57	59.91	1.00	1815	3424
mudress_F1_DCT1RS	-1.14	2.08	-4.66	1.90	1.00	9040	7172

mudress_F1_DCT2RS	-0.95	1.56	-3.57	1.37	1.00	9421	7874
mudress_F2_DCT0RS	25.76	6.90	15.37	37.20	1.00	4311	5532
mudress_F2_DCT1RS	7.50	6.17	-0.17	18.70	1.00	2729	3483
mudress_F2_DCT2RS	-0.93	1.87	-4.04	1.88	1.00	10221	7185
mudress_F3_DCT0RS	-1.34	1.77	-4.34	1.28	1.00	7361	7485
mudress_F3_DCT1RS	0.30	1.21	-1.68	2.21	1.00	9011	8821
mudress_F3_DCT2RS	0.12	1.36	-2.04	2.28	1.00	8905	9004
muface_duration_logRS	7.59	5.18	0.52	16.70	1.00	5876	6042
muface_F1_DCT0RS	21.50	10.56	4.15	38.74	1.00	2497	5573
muface_F1_DCT1RS	8.56	4.20	2.46	15.80	1.00	4619	4886
muface_F1_DCT2RS	2.46	2.64	-1.17	7.19	1.00	8855	7380
muface_F2_DCT0RS	67.95	19.66	40.05	102.37	1.00	2664	4146
muface_F2_DCT1RS	9.34	4.65	2.29	17.01	1.00	2963	3749
muface_F2_DCT2RS	2.11	1.84	-0.51	5.29	1.00	8770	7315
muface_F3_DCT0RS	1.05	2.00	-1.93	4.38	1.00	8031	7696
muface_F3_DCT1RS	-2.40	1.85	-5.54	0.37	1.00	7295	7316
muface_F3_DCT2RS	-2.00	1.94	-5.27	0.89	1.00	8267	7050
mufleece_duration_logRS	0.23	2.88	-4.18	4.90	1.00	6560	5941
mufleece_F1_DCT0RS	-18.77	14.42	-43.38	0.11	1.00	2436	4470
mufleece_F1_DCT1RS	5.93	5.23	-0.48	15.37	1.00	5369	5120
mufleece_F1_DCT2RS	0.54	2.73	-3.49	5.01	1.00	11556	6122
mufleece_F2_DCT0RS	75.93	20.83	46.22	112.19	1.00	2857	4376
mufleece_F2_DCT1RS	1.87	4.61	-3.93	10.24	1.00	8417	5366
mufleece_F2_DCT2RS	3.37	2.07	0.41	6.93	1.00	6910	7441
mufleece_F3_DCT0RS	-2.26	2.80	-7.24	1.44	1.00	5409	4501
mufleece_F3_DCT1RS	0.45	2.32	-3.05	4.24	1.00	12042	6936
mufleece_F3_DCT2RS	0.61	2.09	-2.53	4.13	1.00	10994	7802
mufoot_duration_logRS	-24.06	6.61	-35.34	-14.28	1.00	2089	3921
mufoot_F1_DCT0RS	-4.77	5.46	-14.60	2.07	1.00	2439	4885
mufoot_F1_DCT1RS	-4.75	2.61	-9.26	-0.96	1.00	5644	7062
mufoot_F1_DCT2RS	-0.75	1.79	-3.72	1.97	1.00	10358	7121
mufoot_F2_DCT0RS	-18.31	7.20	-29.96	-6.73	1.00	2920	4317
mufoot_F2_DCT1RS	17.57	5.67	9.34	27.13	1.00	2662	3842
mufoot_F2_DCT2RS	-1.06	2.26	-5.07	2.14	1.00	13235	7668
mufoot_F3_DCT0RS	-1.68	1.67	-4.48	0.82	1.00	9935	8655
mufoot_F3_DCT1RS	-0.25	1.88	-3.28	2.69	1.00	11497	7833
mufoot_F3_DCT2RS	-1.90	2.15	-5.71	1.08	1.00	9475	7393
mugoat_duration_logRS	0.76	2.28	-2.66	4.57	1.00	4952	5681
mugoat_F1_DCT0RS	1.75	3.99	-3.54	8.99	1.00	3414	4478
mugoat_F1_DCT1RS	5.53	2.33	2.02	9.45	1.00	6304	7384
mugoat_F1_DCT2RS	1.71	1.59	-0.58	4.48	1.00	8323	7220
mugoat_F2_DCT0RS	3.60	4.57	-1.78	12.16	1.00	3811	3823
mugoat_F2_DCT1RS	10.28	3.41	5.64	16.16	1.00	2367	2836
mugoat_F2_DCT2RS	-1.78	1.51	-4.38	0.38	1.00	7852	6884
mugoat_F3_DCT0RS	-0.62	1.56	-3.22	1.77	1.00	8422	7886
mugoat_F3_DCT1RS	2.56	1.78	-0.00	5.67	1.00	9478	6371
mugoat_F3_DCT2RS	0.31	1.65	-2.22	3.00	1.00	9086	8132
mugoose_duration_logRS	-3.99	3.40	-10.02	0.60	1.00	4926	6040
mugoose_F1_DCT0RS	-33.64	12.42	-55.11	-16.36	1.00	2280	4121
mugoose_F1_DCT1RS	0.30	2.89	-4.11	4.97	1.00	10210	6859
mugoose_F1_DCT2RS	0.77	2.46	-2.88	4.92	1.00	12195	7136

mugoose_F2_DCT0RS	18.44	11.80	1.71	38.74	1.00	2522	3591
mugoose_F2_DCT1RS	8.04	5.27	0.91	17.42	1.00	3826	4728
mugoose_F2_DCT2RS	0.29	1.72	-2.41	3.10	1.00	9615	7660
mugoose_F3_DCT0RS	-8.73	4.43	-16.43	-2.52	1.00	3377	4196
mugoose_F3_DCT1RS	1.41	2.65	-2.16	6.10	1.00	11528	6859
mugoose_F3_DCT2RS	-2.46	2.35	-6.57	0.83	1.00	9876	7177
mukit_duration_logRS	-20.58	6.61	-31.88	-10.59	1.00	2105	4355
mukit_F1_DCT0RS	6.95	6.19	-1.07	17.92	1.00	2596	5800
mukit_F1_DCT1RS	-2.68	2.38	-6.84	0.72	1.00	6179	6340
mukit_F1_DCT2RS	0.25	1.84	-2.63	3.23	1.00	11872	8540
mukit_F2_DCT0RS	22.45	8.63	9.27	37.00	1.00	3275	5310
mukit_F2_DCT1RS	6.15	5.55	-0.60	16.47	1.00	3281	3437
mukit_F2_DCT2RS	0.10	1.64	-2.49	2.71	1.00	11253	8029
mukit_F3_DCT0RS	1.54	1.96	-1.35	4.88	1.00	9946	7710
mukit_F3_DCT1RS	-1.74	1.66	-4.62	0.64	1.00	8008	7344
mukit_F3_DCT2RS	-2.14	1.77	-5.17	0.45	1.00	7690	6311
mulot_duration_logRS	-10.20	8.30	-24.40	0.90	1.00	1895	4827
mulot_F1_DCT0RS	5.27	7.99	-3.36	20.81	1.00	2306	3965
mulot_F1_DCT1RS	-1.48	2.47	-5.73	1.93	1.00	10048	6308
mulot_F1_DCT2RS	-0.45	2.09	-3.88	2.74	1.00	10170	7793
mulot_F2_DCT0RS	-82.04	20.89	-119.09	-53.82	1.00	2627	3948
mulot_F2_DCT1RS	41.63	10.96	25.55	60.53	1.00	2635	4639
mulot_F2_DCT2RS	3.24	3.19	-1.03	8.89	1.00	9432	7613
mulot_F3_DCT0RS	-0.02	2.10	-3.32	3.25	1.00	12081	8105
mulot_F3_DCT1RS	-1.92	2.61	-6.56	1.63	1.00	10364	7374
mulot_F3_DCT2RS	2.63	2.35	-0.63	6.77	1.00	9037	7933
mumouth_duration_logRS	2.09	5.24	-3.90	11.67	1.00	4472	3697
mumouth_F1_DCT0RS	52.38	15.92	28.98	79.68	1.00	2708	4583
mumouth_F1_DCT1RS	7.80	5.68	0.36	17.81	1.00	6611	6561
mumouth_F1_DCT2RS	0.43	2.60	-3.56	4.72	1.00	12223	7609
mumouth_F2_DCT0RS	-4.04	8.11	-19.82	3.61	1.00	5389	3616
mumouth_F2_DCT1RS	78.05	23.00	46.40	117.95	1.00	2571	4211
mumouth_F2_DCT2RS	-7.05	6.84	-19.61	0.60	1.00	5993	5290
mumouth_F3_DCT0RS	-0.17	2.94	-4.82	4.35	1.00	12691	7115
mumouth_F3_DCT1RS	-3.17	2.92	-8.20	0.83	1.00	7770	7136
mumouth_F3_DCT2RS	0.85	2.72	-2.94	5.44	1.00	9646	5160
munurse_duration_logRS	10.76	6.70	1.21	22.48	1.00	3214	5158
munurse_F1_DCT0RS	30.62	10.50	14.74	48.24	1.00	1930	4179
munurse_F1_DCT1RS	-3.46	3.84	-10.67	1.16	1.00	7220	6387
munurse_F1_DCT2RS	1.57	1.93	-1.26	4.80	1.00	10514	8100
munurse_F2_DCT0RS	-0.57	3.70	-6.65	4.74	1.00	9784	5222
munurse_F2_DCT1RS	11.65	6.64	2.28	23.17	1.00	2602	3610
munurse_F2_DCT2RS	-3.21	2.46	-7.44	0.31	1.00	11051	8333
munurse_F3_DCT0RS	2.66	2.52	-0.78	7.04	1.00	7557	7176
munurse_F3_DCT1RS	0.48	1.76	-2.19	3.40	1.00	11310	8897
munurse_F3_DCT2RS	-1.49	1.89	-4.75	1.27	1.00	11694	7817
mupalm_duration_logRS	21.82	11.07	5.35	40.71	1.00	1676	3432
mupalm_F1_DCT0RS	28.16	14.41	6.09	52.29	1.00	2390	4663
mupalm_F1_DCT1RS	-1.21	3.33	-6.98	3.20	1.00	11239	5508
mupalm_F1_DCT2RS	0.49	2.55	-3.31	4.66	1.00	11945	7358
mupalm_F2_DCT0RS	-86.03	24.69	-130.21	-52.91	1.00	2198	3248

mupalm_F2_DCT1RS	25.11	11.45	7.95	44.45	1.00	2796	5497
mupalm_F2_DCT2RS	0.14	2.52	-3.77	4.19	1.00	11268	6409
mupalm_F3_DCT0RS	4.16	3.79	-0.71	11.01	1.00	9312	7001
mupalm_F3_DCT1RS	0.33	2.41	-3.28	4.27	1.00	11894	7292
mupalm_F3_DCT2RS	0.00	2.55	-3.98	4.02	1.00	11827	7184
muprice_duration_logRS	0.43	2.93	-3.89	5.25	1.00	6054	5629
muprice_F1_DCT0RS	36.45	9.95	22.00	53.56	1.00	2118	3721
muprice_F1_DCT1RS	4.17	2.44	0.61	8.30	1.00	6664	7652
muprice_F1_DCT2RS	-2.98	1.96	-6.37	-0.16	1.00	7229	8075
muprice_F2_DCT0RS	0.01	3.08	-4.82	4.81	1.00	9736	6597
muprice_F2_DCT1RS	-1.99	2.25	-5.86	1.25	1.00	3552	5884
muprice_F2_DCT2RS	0.25	1.48	-2.08	2.60	1.00	11403	8673
muprice_F3_DCT0RS	1.93	2.08	-1.08	5.51	1.00	9470	7786
muprice_F3_DCT1RS	0.27	1.28	-1.75	2.30	1.00	11099	8983
muprice_F3_DCT2RS	-0.64	1.44	-3.00	1.56	1.00	11451	8285
mustrut_duration_logRS	-19.91	6.69	-31.24	-9.77	1.00	2051	4164
mustrut_F1_DCT0RS	35.41	10.13	20.65	52.81	1.00	1911	3582
mustrut_F1_DCT1RS	0.36	1.70	-2.28	3.15	1.00	8899	7298
mustrut_F1_DCT2RS	0.03	1.41	-2.22	2.28	1.00	9844	9029
mustrut_F2_DCT0RS	-22.74	7.31	-34.72	-11.53	1.00	3471	5100
mustrut_F2_DCT1RS	24.09	7.75	12.42	36.92	1.00	2323	3556
mustrut_F2_DCT2RS	1.18	1.93	-1.72	4.40	1.00	11379	8695
mustrut_F3_DCT0RS	0.83	1.59	-1.64	3.40	1.00	8185	7876
mustrut_F3_DCT1RS	-0.35	1.41	-2.63	1.87	1.00	9051	8805
mustrut_F3_DCT2RS	1.51	1.50	-0.78	4.00	1.00	8550	8271
muthought_duration_logRS	11.24	18.59	-2.43	40.35	1.00	2174	1590
muthought_F1_DCT0RS	-48.21	62.19	-155.53	0.42	1.00	1223	1481
muthought_F1_DCT1RS	-1.86	8.64	-13.12	5.95	1.00	7148	2138
muthought_F1_DCT2RS	5.63	15.70	-4.13	28.79	1.00	3162	1202
muthought_F2_DCT0RS	-157.25	86.33	-314.90	-80.00	1.00	1266	1186
muthought_F2_DCT1RS	38.05	22.49	1.86	74.97	1.00	2306	2259
muthought_F2_DCT2RS	0.87	4.81	-4.60	7.70	1.00	7032	3497
muthought_F3_DCT0RS	0.40	4.45	-5.62	6.92	1.00	10783	4795
muthought_F3_DCT1RS	-3.22	8.42	-17.47	4.15	1.00	5509	2115
muthought_F3_DCT2RS	-1.00	6.81	-9.78	6.09	1.00	9634	2949
mutrap_duration_logRS	-12.72	6.79	-24.01	-2.03	1.00	2273	4424
mutrap_F1_DCT0RS	66.33	12.14	48.43	86.90	1.00	2129	3533
mutrap_F1_DCT1RS	-1.29	2.22	-5.11	1.91	1.00	10872	8143
mutrap_F1_DCT2RS	-2.74	1.98	-6.11	0.17	1.00	10513	8496
mutrap_F2_DCT0RS	1.27	4.24	-4.18	8.78	1.00	6452	4435
mutrap_F2_DCT1RS	19.77	8.12	7.44	33.56	1.00	2606	3828
mutrap_F2_DCT2RS	-1.57	2.12	-5.32	1.49	1.00	10284	7414
mutrap_F3_DCT0RS	-4.74	2.15	-8.30	-1.47	1.00	5903	6790
mutrap_F3_DCT1RS	2.05	1.54	-0.28	4.65	1.00	8220	7752
mutrap_F3_DCT2RS	-1.91	1.52	-4.45	0.40	1.00	8377	9023

Draws were sampled using sampling(NUTS). For each parameter, Bulk\_ESS and Tail\_ESS are effective sample size measures, and Rhat is the potential scale reduction factor on split chains (at convergence, Rhat = 1).

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