

Project 3: Determining the trajectory of memory decline in individuals with and without mild cognitive impairment

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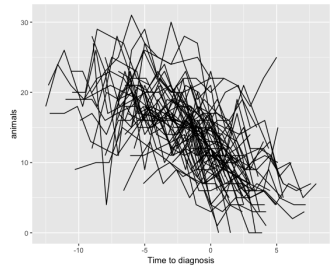
Questions of Interest:

- ▶ What is the rate of memory decline based on these measures over the aging process in healthy individuals?
- ▶ What is the rate of memory decline based on these measures over the aging process in those diagnosed with MCI/dementia during the study?
- ▶ Is there a period of time before the diagnosis of MCI/dementia in which the rate of the memory decline changes (or accelerates)?

Initial Trajectories



as.factor(demand)



Approach

1. Make sure data is cleaned: remove individuals with less than three measurements of category fluency for animals
2. Fit a linear mixed model, account for correlation of measurements within a person by allowing for a random intercept, adjust for age, gender, socioeconomic status, dementia status, and age*dementia interaction and tau
3. Find a “change point”, time point at which the rate of memory decline changed in those individuals diagnosed with dementia as opposed to those without dementia
4. Determine a measure of variation around the estimates of decline in the model and the change point

Results

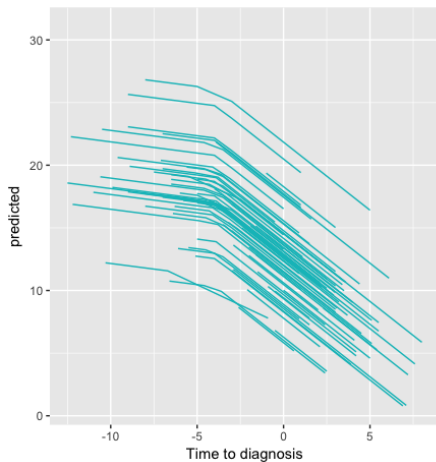
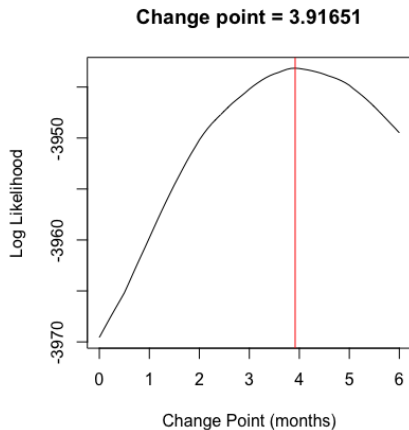
	Overall	demind = 0	demind = 1
n	187	119	68
gender (%)			
1	82 (43.9)	59 (49.6)	23 (33.8)
2	105 (56.1)	60 (50.4)	45 (66.2)
SES (mean (sd))	49.32 (11.68)	49.66 (10.86)	48.74 (13.07)
age (mean (sd))	80.10 (8.87)	77.16 (8.92)	85.24 (6.01)
animals (mean(sd))	17.33 (5.11)	18.30 (4.99)	15.62 (4.91)

Figure 1: Table One

	Estimate	Standard Error (Adj.)	T-statistic	p-value	95% CI
(Intercept)	31.88781	2.71335	11.75219	p < .00001	(26.57,37.21)
age	-0.17765	0.02521	-7.04614	p < .00001	(-0.23,-0.13)
demind	-0.61797	12.52304	-0.04935	p = 0.96	(-25.16,23.93)
tau	-0.90671	0.12400	-7.31236	p < .00001	(-1.15,-0.66)
gender	-0.53722	0.55696	-0.96455	p = 0.34	(-1.63,0.55)
SES	0.03931	0.02346	1.67570	p = 0.0955	(-0.01,0.09)
age:demind	-0.00101	0.15240	-0.00659	p = 0.9944	(-0.30,0.30)

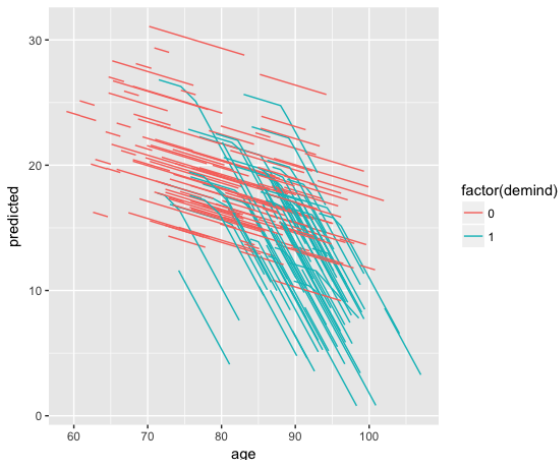
Figure 2: Results

Predicted Value and Change Point



Conclusions

- ▶ The slope for those with dementia was not significantly different from those without dementia before the change point
- ▶ The slope for those with dementia was significantly different from those without dementia after the change point



- ▶ Future considerations: consider other 3 outcomes, look for