Cortical shape analysis

= if male, 1 else 0

= age at first scan - age at scan

= if CAP at entry < 290, 1 else 0

= if CAP at entry 368 and 290, 1 else 0

= if CAP at entry > 368, 1 else 0

LMM Model:

Where is the cortical shape features (local gyrification index, sulcal depth, or cortical thickness), are the fixed effects and are the random effects.

You need to make the model identifiable by letting β­0 be the Control intercept. So, the model should be

Where is the subject index ( and is the time index (). The omnibus test that I was speaking of is

In words, the null is that each of the CAP group intercepts is no difference than the Control group intercept. This can be tested with a chi-squared test on df = 3 using the quadratic form statistic

Where is the variance of , is the covariance of and , etc. The chi-squared test is relatively easy to set up using the multcomp package after you estimate the mixed models with lme4. You use the general linear hypothesis function, glht(). The procedure is very similar to this article: <https://stats.idre.ucla.edu/r/faq/how-can-i-test-contrasts-in-r/>

The difference is that you feed glht()the fitted lmer() object rather than the lm() object in the article. There are probably better articles online.