Evaluating random slopes for model with AR(1) model at level-1

HMLM and HMLM2 do not produce final tables for the variance components and chi-square statistics for individual components as is the case with HLM2 and HLM3. Consider the model given in the HLM manual:

Model 1:

Level-1 Model

```
Y=IND1*Y1+IND2*Y2+IND3*Y3+IND4*Y4+IND5*Y5
Y*=B0+B1(AGE13)+B2*(AGE13S)+R
```

Level-2 Model

```
B00=G00+U0
B1=G10
B2=G20
```

Suppose that it was possible to estimate the model

Model 2:

Level-1 Model

```
Y=IND1*Y1+IND2*Y2+IND3*Y3+IND4*Y4+IND5*Y5
Y*=B0+B1(AGE13)+B2*(AGE13S)+R
```

Level-2 Model

```
B00=G00+U0
B1=G10+U1
B2=G20
```

To evaluate the random slope in the second model, fit both models as shown above: that is, models with and without the random slope of interest. The difference between the two deviance statistics obtained for the respective models has a χ^2 distribution with degrees of freedom equal to the difference in the number of parameters estimated. In this case, the Tau-matrix for model 2 has three non-duplicated elements

var(u0)
cov(u1,u0) var(u1)

compared to the Tau for model 1 with only one element, i.e. $\mathrm{var}(u_0)$. The difference in the number of parameters estimated is thus equal to 2. Note that by using this approach, the researcher is essentially testing that all variance-covariance components associated with the level-1 predictor are making a significant contribution to the explanation of variation in the outcome.