**List of Variables in the Residual File for hsb example**

**Level-1 Residual File**

L1RESID

 Difference between the fitted (predicted) and observed value for each level-1 unit

FITVAL

 The fitted (predicted) value for each level-1 unit

SIGMA

 The square root of σ2

**Level-2 Residual File**

L2ID

 Level-2 ID

NJ

 Number of units in each Level-2 group *j*

CHIPCT

 Expected values of the order statistics for a sample of size *j* from a population distributed as chi-square(*v*) where *v* is the number of random effects per unit. Used for comparison with MDIST.

MDIST

 Based on *q* Level-1 coefficients, Mahalanobis distances (the standardized squared distance of a unit from the center of a *v*-dimensional distribution). This includes the set of residuals from Level-2 combined. If normality assumption is true, the MDIST values should be distributed approximately χ2(*v*).

*Three estimates of Level-1 Variability (Level-1 residuals):*

LNTOTVAR

 Natural logarithm of the total standard deviation within each unit.

OLSRSVAR

 Natural logarithm of the residual standard deviation within each unit based on its least squares regression – for those units with sufficient data to compute level 1 OLS estimates.

MDRSVAR

 Natural logarithm of the residual standard deviation from the final, fitted fixed effects model. A histogram illustrates the degree of homogeneity of variance at Level-1.

EBINTRCP (*u*0)

 Empirical Bayes intercept residuals. Comparing with OL estimates illustrates the degree of shrinkage (similar for slope comparison). Plotting EB residuals against possible additional Level-2 predictors is one potential exploratory analysis method.

EBSES (*u*1)

 Empirical Bayes SES slope residuals. Scatterplot against MEANSES illustrates the linearity of the relationship between SES slope and MEANSES.

OLINTRCP

 OLS intercept residuals (only estimated for units with enough data).

OLSES

 OLS SES slope residuals (for units with enough data).

FVINTRCP (β0)

 Fitted (predicted) values of the intercept.

FVSES (β1)

 Fitted values of the SES slope.

ECINTRCPT (β0)

 Fitted (predicted) values of the intercept.

ECSES (β1)

 Fitted values of the SES slope.

PV00

 Posterior variance of the intercept residual (*u*0).

PV10

 Posterior covariance between the intercept residual and slope residual.

PV11

 Posterior variance of the slope residual (*u*1).

PVC00

 Posterior variance of the estimates (coefficients) of the intercept (β0).

PVC10

 Posterior covariance between the intercept residual and slope.

PVC11

 Posterior variance of the estimates of the slope (β1).

Note:

 By adding the EB or OL residuals to the FV values, you can obtain an estimate of the coefficients (βs).

 OL residuals are only produced for those units which have sufficient data to permit a separate OLS estimation of the Level-1 model for that unit. EB estimates are provided for all units.

 Any variable included during the “create residual file” dialogue will also be included for comparative or explorative purposes.