

In LME models, fitted by either ML or REML, an important overall influence measure is the likelihood distance (?). The procedure requires the calculation of the full data estimates  $\hat{\psi}$  and estimates based on the reduced data set  $\hat{\psi}_{(U)}$ . The likelihood distance is given by determining

$$LD_{(U)} = 2\{l(\hat{\psi}) - l(\hat{\psi}_{(U)})\} \quad (1)$$

$$RLD_{(U)} = 2\{l_R(\hat{\psi}) - l_R(\hat{\psi}_{(U)})\} \quad (2)$$

The likelihood distance is a global summary measure expressing the joint influence of the observations in the set U on all parameters in  $\Psi$  that were subject to updating.

# 1 Likelihood Distance

The likelihood distance gives the amount by which the log-likelihood of the full data changes if one were to evaluate it at the reduced-data estimates. The important point is that  $l(\psi_U)$  is not the log-likelihood obtained by fitting the model to the reduced data set.

It is obtained by evaluating the likelihood function based on the full data set (containing all  $n$  observations) at the reduced-data estimates.

The likelihood distance is a global, summary measure, expressing the joint influence of the observations in the set  $U$  on all parameters in  $\psi$  that were subject to updating.

## 1.1 Likelihood Distance

The likelihood distance is a global, summary measure, expressing the joint influence of the observations in the set  $U$  on all parameters in  $\phi$  that were subject to updating.

# 2 Likelihood Distance

The likelihood distance is a global summary measure that expresses the joint influence of the subsets of observations,  $U$ , on all parameters in  $\phi$  that were subject to updating. ? points out the likelihood distance gives the amount by which the log-likelihood of the model fitted from the full data changes if one were to estimate the model from a reduced-data estimates. Importantly  $LD(\psi_U)$  is not the log-likelihood obtained by fitting the model to the reduced data set. It is obtained by evaluating the likelihood function based on the full data set (containing all  $n$  observations) at the reduced-data estimates.

$$LD(U) = 2[l(\hat{\phi}) - l_{\hat{\phi}_\omega}]$$
$$RLD(U) = 2[l_R(\hat{\phi}) - l_{R(\hat{\phi})_\omega}]$$

### 3 Likelihood Distance

The likelihood distance gives the amount by which the log-likelihood of the full data changes if one were to evaluate it at the reduced-data estimates. The important point is that  $l(\psi_U)$  is not the log-likelihood obtained by fitting the model to the reduced data set.

It is obtained by evaluating the likelihood function based on the full data set (containing all  $n$  observations) at the reduced-data estimates.

The likelihood distance is a global, summary measure, expressing the joint influence of the observations in the set  $U$  on all parameters in  $\psi$  that were subject to updating.

#### 3.1 Likelihood Distance

The likelihood distance is a global, summary measure, expressing the joint influence of the observations in the set  $U$  on all parameters in  $\phi$  that were subject to updating.

## 4 Likelihood Distance

The likelihood distance gives the amount by which the log-likelihood of the full data changes if one were to evaluate it at the reduced-data estimates. The important point is that  $l(\psi_U)$  is not the log-likelihood obtained by fitting the model to the reduced data set.

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The likelihood distance is a global, summary measure, expressing the joint influence of the observations in the set  $U$  on all parameters in  $\psi$  that were subject to updating.

### 4.1 Likelihood Distance

The likelihood distance is a global, summary measure, expressing the joint influence of the observations in the set  $U$  on all parameters in  $\phi$  that were subject to updating.