Forward and backward propagation

The Explorer tree not only makes it easy to navigate the sequence of steps taken in an analysis but also, importantly, reflects the program's internal knowledge of the inter-relationships among data, resemblance sheets and plot windows. It uses this structure to select sensible defaults, and even occasionally to reach *back* and find a data matrix higher up the same branch, needed for a specific operation. (An example of this has been seen in running SIMPROF from the various clustering methods – these routines are all launched with a resemblance matrix as the active sheet, but the tests require permutation of rows or columns of the preceding data matrix).The Explorer tree is also used for forward and backward propagation of factor/indicator information, along a single branch of the tree. A factor's properties, such as symbol types for each level, are naturally passed down a branch as new data sheets or plots are formed from the data sheet for which that factor was created. The reverse is also true: definition of new factors, produced from an editing step on a plot, will typically be passed back to the data matrix at the head of that branch, and then down other branches leading from the original sheet. But such information is not passed from one branch to a distinct branch (factors can be retrieved from distinct branches by **Edit>Factors>Import**), and there are also natural blocks to propagation. For example, if a **Tools>Average** (or **Sum** or **Merge**) operation – see Section 11 – is carried out part way down a branch, PRIMER 7 (unlike PRIMER 6) will now place the resulting averaged sheet on the same branch as its parent matrix, and all factors will be passed forward to the condensed sheet (though some factors may have undefined entries if the averaging has been over levels which differ for those factors). However, changes now to factors of the condensed matrix clearly cannot sensibly be backward propagated to the original larger sheet.

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