GROWTH CURVE MODEL WITH HIERARCHICAL WITHIN-INDIVIDUALS DESIGN MATRICES

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Abstract. This paper deals with some inferential problems under an extended growth curve model with several hierarchical within-individuals design matrices. The model includes the one whose mean structure consists of polynomial growth curves with different degrees. First we consider the case when the covariance matrix is unknown positive definite. We derive a LR test for examining the hierarchical structure for within-individuals design matrices and a model selection criterion. Next we consider the case when a random coefficients covariance structure is assumed, under certain assumption of between-individual design matrices. Similar inferential problems are also considered. The dental measurement data (see, e.g., Potthoff and Roy (1964, *Biometrika*, **51**, 313–326)) is reexamined, based on extended growth curve models.

Key words and phrases: Extended growth curve model, hierarchical within-individuals design matrices, inferential problems, random-coefficient model.