

# MULTILEVEL LINEAR MODELS FOR THE EDUCATIONAL SYSTEM

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## 1. INTRODUCTION

During the last eight years, interest in assessing the comparative performance of teachers, schools and educational policies has greatly increased in the USA, the UK and other countries. Particularly in the context of declining budgets for education, a serious concern for accountability and effectiveness of the school system has led to attempts to rate teachers, schools, education authorities and even states using simple summaries of administrative data and aggregate scores on standardized tests. These attempts at ratings have aroused anxiety, anger and even legal challenges. Some of the simple methods of comparison or rating used in the past have been seriously defective methodologically, and unwarranted conclusions have been drawn from them. In this paper I describe a model for a hierarchically structured educational system, the analysis of which provides a methodologically sound description of differences among teachers, schools, authorities and states. The implications of this model for educational policy issues are then discussed, and two general conclusions are drawn:

- i) in general, it is impossible to assess in a methodologically sound way the effect of a change or “intervention” in educational policy on outcome variables from this model, unless the change is embedded in some form of randomized experiment;
- ii) the assessment of such effects is necessary over an extended period of time, requiring longitudinal analysis of data from the model.

## 2. HIERARCHICAL MODEL FOR AN EDUCATIONAL SYSTEM

An educational system is not homogeneous: there are distinct differences in educational policies, teacher training, curricula, per-student spending, parents’ attitude and many other variables across states, educational authorities, schools and classes. A natural representation of the system is a *hierarchy*, with states at the highest level, education authorities or counties grouped or *nested* within states, schools nested within education authorities, classes nested within schools, and students nested within classes. At each