

Some considerations on Hierarchical Linear Models

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Most studies use data sets characterized by a multilevel (hierarchical or nested) structure – smaller units of analysis are often within one or more larger units of analysis. For instance, pupils (also referred level 1 units) are grouped into, or nested within, higher level units, classes/courses (level 2 units) belonging to schools (level 3 units). In this case: - The characteristics of some larger context (classes, courses, schools, neighborhood) are expected to influence individual behavior. - Pupils in a class share whatever characteristics the group has. One of the important characteristics of such data is that units at level 1 are not independent. This lack of independence means that traditional ordinary least-squares (OLS) techniques cannot be used because such analyses violate a fundamental assumption – the independence of observations. And a single-level analyses that ignore the multilevel (hierarchical) structure of the data can provide misleading results. Hierarchical data can be analyzed without artificially restructuring the data by employing Multilevel Models (Goldstein, 1995) or Hierarchical Linear Models (Bryk & Raudenbush, 1992). A multilevel or Hierarchical Linear Model (HLM) is a statistical model applied to data collected at more than one level in order to elucidate relationships at more than one level (Luke, 2004). The HLM assumes hierarchical data, with one response variable measured at the lowest level and explanatory variables at all existing levels.

References

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