LONGITUDINAL ANALYSIS FOR ORDINAL DATA THROUGH MULTILEVEL AND ITEM RESPONSE MODELING: APPLICATIONS TO CHILD OBSERVATION RECORD (COR)

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Abstract
The large proportion of children from low SES backgrounds and the increasing achievement gap between disadvantaged children and their more advantaged peers are beckoning national attention to investment in early childhood education (Reid, Kagan, Hilton, & Potter, 2015). As evidenced in many research studies (e.g., Heckman & Masterov, 2007), early childhood experiences are critical to the development of children. High-quality early learning is necessary for children, especially disadvantaged children, to narrow the school readiness gap and to build a foundation for more advanced academic, social, and cognitive skills. Importantly, high quality assessment tools (i.e., reliability and validity evidence supporting the use and interpretation of scores from a given instrument) are a necessary component of early childhood education.

The Preschool Child Observation Record (Preschool OnlineCOR, High/Scope, 2003) is an observational assessment tool created by the High/Scope Educational Research Foundation, a nonprofit, research, and training organization focused on early childhood development. First, a comprehensive evaluation of the psychometric qualities of the Preschool OnlineCOR was conducted; including dimensionality, reliability, item properties, and measurement invariance. Second, a short form of the Preschool OnlineCOR (COR-ST) was developed. Third, this study examined the growth trajectories of 3- and 4-year-old children on the general factor measured by the COR-ST through traditional multilevel growth modeling and more advanced multilevel growth modeling approaches, including multilevel item response theory modeling (MLIRT; Kamata, 2001; Liu & Hedeker, 2006; Pastor & Beretvas, 2006; Sulis & Toland, 2016), and multiple indicator multilevel modeling (MIML; Muthén and Muthén, 1998-2015). The traditional multilevel growth model consists of two steps: 1) one score is calculated to represent the general factor for each child at each time point based on their raw item scores through either classical test theory (CTT) or IRT (item response theory) approaches, and 2) the growth trajectory is modeled based on the overall COR-ST score at each time point. In comparison, the more advanced approaches, MLIRT and MIML growth models, model directly using item-level information (item scores), which simultaneously estimate item-level parameters, change over time, and effects of child predictors.

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Multilevel models for analyzing longitudinal data. Models for evaluating changes in “elevation” and “slope” over time. Using multilevel models to analyze “treatment effects” over time. The seminar will focus on the construction and interpretation of these models with the aims of appealing to users of all multilevel modeling packages (e.g., HLM, SAS PROC MIXED, MLwiN, SPSS mixed, etc.). For the sake of realism, many examples will be run using HLM, but examples of using SAS PROC MIXED and MLwiN will also be included. A comparison of strategies for analyzing longitudinal data. An Example : Kids’ The Preschool Child Observation Record (Preschool OnlineCOR, High/Scope, 2003) is an observational assessment tool created by the High/Scope Educational Research Foundation, a nonprofit, research, and training organization focused on early childhood development. First, a comprehensive evaluation of the psychometric qualities of the Preschool OnlineCOR was conducted; including dimensionality, reliability, item properties, and measurement invariance. Recommended Citation. Li, zijia, "Longitudinal analysis for ordinal data through multilevel and item response modeling: applications to child observation record (cor)" (2016). Theses and Dissertations--Educational, School, and Counseling Psychology. Ordinal data classification is an integral step towards proper collection and analysis of data. Therefore, in order to classify data correctly, we need to first understand what data itself is. Data is a collection of facts or information from which conclusions may be drawn. For example, ordinal data is said to have been collected when a responder inputs his/her financial happiness level on a scale of 1-10. In ordinal data, there is no standard scale on which the difference in each score is measured. Considering the example highlighted above, let us assume that 50 people earning between $1000 to $10000 monthly were asked to rate their level of financial happiness. Child - 0 to 12 years. Teenager - 13 to 19 years. Youth - 20 to 35 years. This article presents applications for the analysis of multilevel ordinal response data through the proportional odds model. Data are drawn from the public-use Early Childhood Longitudinal Study. Results showed that gender, number of family risk characteristics, and age at kindergarten entry were associated with initial reading proficiency (0 to 5 scale). The number of family risks and age were associated with time-slopes. Her research interests include data analysis for ordinal-level response variables and multilevel modeling of health and educational outcomes. Heather Levitt Doucette is at the Connecticut State Department of Education and is a graduate student in the Department of Educational Psychology at the University of Connecticut. With longitudinal data the most common summaries are the average response and the time slope. A second approach is a pre-post analysis which analyzes a single follow-up response in conjunction with a baseline measurement. In section 1.3.1 we rst review average or slope analyses, and then in section 1.3.2 we discuss general approaches to pre-post analysis. 1.3.1 Average or Slope Analysis In any longitudinal analysis the substantive aims determine which aspects of the response trajectory are most important. For some applications the repeated measures over time may be averaged, or if the timing o