

# General Semiparametric Analysis of Repeated Measures Data

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## Abstract

This talk considers the general problem where the data for an individual are repeated measures in the most general sense, with a parametric component and a nonparametric component. It is easy, although not well-known, to handle the problem in the case that the nonparametric component of the likelihood function is evaluated exactly once, e.g., when a baseline variable is modeled nonparametrically. Far more difficult, and non-intuitive, is the case where the nonparametric component is evaluated more than once in the likelihood function. Examples include repeated measures studies, variance component models when the random effect is related to the predictors, matched case-control studies with a nonparametric component, fixed-effects models in econometrics, etc. I will present a constructive (i.e., computable), semiparametric efficient method for this general problem. The constructive part is important: like most semiparametric efficient methods, there is an integral equation lurking in the background, but unlike most such methods, in our approach the integral equation can be avoided. An example involving caloric intake and income in China is used to illustrate the methodology, as a means of contrasting a random effects analysis and a fixed effects analysis.