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# Seminar

## PROFILE SCORE ADJUSTMENTS FOR INCIDENTAL PARAMETER PROBLEMS

**Geert Dhaene**

**KU Leuven**

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**Abstract :** [www.stat.unipd.it/fare-ricerca/seminari](http://www.stat.unipd.it/fare-ricerca/seminari)

# PROFILE SCORE ADJUSTMENTS FOR INCIDENTAL PARAMETER PROBLEMS\*

## Geert Dhaene

Full Professor | Faculty of Economics and Business | Catholic University of Leuven (KU Leuven, Belgium)

We propose a scheme of iterative adjustments to the profile score to deal with incidental-parameter bias in models for stratified data with few observations on a large number of strata. The first-order adjustment is based on a calculation of the profile-score bias and evaluation of this bias at maximum-likelihood estimates of the incidental parameters. If the bias does not depend on the incidental parameters, the first-order adjusted profile score is fully recentered, solving the incidental parameter problem. Otherwise, it is approximately recentered, alleviating the incidental parameter problem. In the latter case, the adjustment can be iterated to give higher-order adjustments, possibly until convergence. The adjustments are generally applicable (e.g., not requiring parameter orthogonality) and lead to estimates that generally improve on maximum likelihood.

We examine a range of nonlinear models with covariates. In many of them, we obtain an adjusted profile score that is exactly unbiased. In the others, we obtain approximate bias adjustments that yield much improved estimates, relative to maximum likelihood, even when there are only two observations per stratum.

*\* Joint work with Koen Jochmans*