

Title: Bootstrapping One-way Arrays

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Abstract

We will discuss joint work with Chris Field on issues which arise when bootstrapping random effect or hierarchical models. Since in these models, there are unobserved random effects, the usual bootstrap approach of resampling residuals is not straightforward. It is important that we take careful account of the two or more sources of variation. We focus is on the oneway random effects model where the important issues are present.

An important issue is what criteria should we use to assess whether a bootstrap works or not? Suggestions have been made by Davidson and Hinkley (1997) (the bootstrap observations should have the same second moment structure as the original observations and McCullagh (2003) (the bootstrap observations should be exchangeable under a suitable group structure). We will explore the value of these criteria against our own criterion (a bootstrap should at least estimate the variance of a statistic consistently) by considering a number of bootstraps and deriving their properties.