



## Research in Survey Sampling: from Practice to Theory

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### Abstract:

This presentation is part of the invited session entitled "Women in survey sampling research and practice". In my opinion, one of the main interests of research in survey sampling is to deepen the understanding of methods used in practice through theoretical studies. I will illustrate this point of view on two research projects of mine, recent or in progress. Both projects are based on large French surveys for which complex survey designs were defined for practical reasons. The first survey is the 2011 French Longitudinal Survey on Childhood (ELFE) for which a cross classified sampling was implemented. The second survey is the monthly French postal service survey for which a double indirect sampling is currently used. These sampling designs are not usual ones and were not studied in detail in the survey sampling literature at the time of the surveys. Compared to more classical designs, the variance computation for instance was not known even for classical estimators such as the Horvitz-Thompson estimator. At first glance, these designs can be considered as close to more classical designs: the two-stage sampling for the ELFE survey and the usual indirect sampling for the postal survey. However, further theoretical study has allowed us to show that these designs can lead to poorly accurate estimators compared to the usual ones. Only in-depth theoretical studies can provide a detailed understanding of the behavior of methods that may seem convenient from a practical point of view. And I find it particularly rewarding as a researcher to get useful results for large national surveys.

### Keywords:

Complex sampling design; Cross classified sampling; Indirect sampling; Variance estimation;