

# Conditional Distribution of Goodness-of-Fit Tests

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## Summary

The idea is to advocate the use of the conditional distribution of the goodness-of-fit test given the value of  $T_n$ , the minimal sufficient statistic. This, in the problem of testing fit of a distribution in presence of unknown parameters. Since the parameters themselves are not of interest, they are considered nuisance and so conditioning seems to be appropriate. Some comments are made regarding this procedure and emphasis is placed on the fact that with this approach there is no need for sets of tables but rather for just an algorithm based on simulation which produces the “exact” conditional p-value. So it is claimed to be an exact level  $\alpha$ , finite- $n$  procedure, in the continuous case. It may be used in the discrete case but level would be approximate because of discreteness of  $T_n$ . The inverse Gaussian is discussed, comparing the results of the advocated procedure with recent work, showing that for the alternatives studied, there is an increase of power.

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