

ADMISSIBLE AND MINIMAX ESTIMATION OF THE PARAMETERS OF
THE SELECTED NORMAL POPULATION IN TWO-STAGE ADAPTIVE
DESIGNS UNDER REFLECTED NORMAL LOSS FUNCTION

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Abstract: In clinical research, one of the key problems is to estimate the effect of the best treatment among the given k treatments in two-stage adaptive design. Suppose the effects of two treatments have normal distributions with means θ_1 and θ_2 , respectively, and common known variance σ^2 . In the first stage, random samples of size n_1 with means \bar{X}_1 and \bar{X}_2 are chosen from the two populations. Then the population with the larger (or smaller) sample mean \bar{X}_M is selected, and a random sample of size n_2 with mean \bar{Y}_M is chosen from this population in the second stage of design. Our aim is to estimate the mean θ_M (or θ_J) of the selected population based on \bar{X}_M and \bar{Y}_M in two-stage adaptive design under the reflected normal loss function. We obtain minimax estimators of θ_M and θ_J , and then provide some sufficient conditions for the inadmissibility of estimators of θ_M and θ_J . Theoretical results are augmented with a simulation study as well as a real data application.

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