

TOWARDS A MORE CONCEPTUAL WAY OF UNDERSTANDING AND IMPLEMENTING INFERENCE RULES

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There is a large literature on using simulations to understand the intuition of inference. However, the foundations of standard inference still rely on often seemingly mysterious ideas of sampling distributions of a statistic instead of a sample. In 2011, Wild and colleagues introduced novel ways of considering sampling distributions by investigating distributions of boxplots instead of distributions of sample statistics. Indeed, an understanding of how the entire sample varies from study to study allows the student to recognize the variability of not only the statistic of interest (e.g., the mean) but also the standard deviation and sample size associated with the sample.

We investigate the ad hoc rules of Wild et al. associated with inferring that population A tends to have larger values than population B. In particular, we compare their rules to standard tests of center (t-tests and Wilcoxon Rank Sum tests). Our analyses take into account effect size, sample size, standard deviation, balance, population distribution, and amount of noise. We give a discussion of the advantages of using distributions of samples to understand inference in light of other considerations (e.g., power, ease of use, deeper understanding).