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RRA week of 11/12

Annotated Entry: Journal

In this paper, Nathan Pike illustrated the ideology and general processes of applying false discovery rate in ecology studies when doing multiple comparisons. In the first part of paper, he identified the concept of math of FDR. The rejection of null hypothesis being a discovery and the failure of rejecting null hypothesis when it should have been rejected being a false discovery. Being said, the rate of wrongly rejected null hypothesis is identified as false discovery rate (FDR). Pike, in the following section of the paper, explained the mathematics behind the FDR in relations to P-value as well as how to properly address such values in context of ecology studies. He then concluded that utilizing FDR is appropriate for multiple comparison procedures in practice. The second part of the paper introduced some of the algorithms that controls FDR, followed by a discussion on adjusted P-values and q-values. According to Pike, the adjusted p-value was adjusted in order to make the multiple comparison valid, as the q-value was defined as the probability of a truly not significant result being called significant. Pike also stated that these two terms were used interchangeably in many statistical programs.

Looking at Motulsky’s IBS, the term FDR appeared several times through the text. In the P-value chapter, FDR was mentioned during the introduction of FPR/FPRP (169-172), which was mainly taking about single comparison. In Motulsky’s word, FPR and FDR means the same. Again, Motulsky discussed this term in the chapter of statistical traps, where mixing up significant level and FDR could be fatal to one’s analysis. Motulsky’s text talked about FDR or FPR more in context of prior probability rather than application on multiple comparison, yet the idea of using FDR as a tool of accessing datasets.

Reference: Pike, Nathan. *Using false discovery rates for multiple comparisons in ecology and evolution.* Methods in Ecology and Evolution *2011, 2, 278–282 doi: 10.1111*