

The Accuracy of P-values for a Multi-category Bernoulli Response

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Suppose a multi-category Bernoulli distribution with parameters that are a function of t . Samples are independently taken at t_1 and t_2 . Given a single multi-category Bernoulli observation at an unknown t , t_* , we would like to determine a tenable set of ts between t_1 and t_2 for t_* . More specifically, our interest is in the probability of the sample at t_* coming from the populations at some t_0 between t_1 and t_2 . If the common interpretation of a p-value is true, then p-values should be close to this probability. Three different approaches for obtaining p-values are used: a generalized linear model approach, a linear model approach, and a modified version of Pearson's Chi-square test statistic. The p-values from these approaches are compared to a target probability to determine each method's accuracy.