

Design of Acceptance Binomial Tests by Average Sample Number Parameter

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The binomial Sequential Probability Ratio Test (SPRT) consists of Bernoulli trials, in which the probability of failures in a single observation equals one. The acceptance test is a check of the hypothesis that the probability of failure of an item (or that of an item proving defective) does not exceed a given value. The binomial SPRT are not new, and extensive literature on them is available. However, advances in the field of computers and softwares open new possibilities for improved test planning. As the truncated test has multiple different characteristics, it is also necessary to establish an optimality criterion whereby the best test can be compared and unambiguously chosen. The ideal solution would be formulae unambiguously determining the above three parameters, and formulae for the Average Sample Number (ASN).

The paper presents parameters for assessment of the quality of a planned test. One of these parameters is the increase in the ASN caused by the truncation. It was shown that an optimality criterion based on it considerably facilitates solution of the problems in question. Also given are formulas for determining the parameters of the test boundaries, depending on the required test characteristics.