ABSTRACTS OF PAPERS

(Abstract of a paper presented at the Western Regional meeting, Berkeley, California, July 19–21, 1965. Additional abstracts appeared in earlier issues.)

28. On robust procedures. Joseph L. Gastwirth, The Johns Hopkins University. (Invited)

This paper discusses a procedure for finding robust estimators of the location parameter of symmetric unimodal distributions. The estimators are based on robust rank tests and the methods used are applicable to more general situations. To every density function there corresponds an asymptotically most powerful rank test (amprt). For a set $(f_1, \cdots, f_n)$ of density functions the maximum robust rank test, R, maximizes the minimum limiting Pitman efficiency for samples from any one of the f_i, $i = 1, \cdots, n$. This maximum test can be used to construct estimators according to the proposal of Hodges and Lehman (*Ann. Math. Statist.* **34** 598–611); the robust test, R, generates another estimator T in the following manner. If the test based on R is the amprt for samples from a density function $g(x - \theta)$, then the estimator T will be the best linear unbiased estimate (blue) of the location parameter for samples from $g(x)$. Explicit formulas for the maximum robust test and the corresponding estimate T are derived. The relationship of the present paper to the work of Huber (*Ann. Math. Statist.* **35** 73–102) is discussed and it is shown that the blue corresponding to his least favorable distribution is the trimmed mean.

(Abstract of a paper presented at the Annual meeting, Philadelphia, Pennsylvania, September 8–11, 1965. Additional abstracts appeared in earlier issues.)

55. Some results on lower bounds for ASN. Gordon Simons, University of Minnesota. (By title)

Consider a test of hypotheses where we are to choose among K densities f_i, $i = 1, \cdots, K$; $K = 2, 3, \cdots$. Let $A = (\alpha_{ij})$ be the $K \times K$ error matrix with $\alpha_{ij} = P$ (accepting $f_j \mid f_i$ valid) and let f_0 be another density. Let E_0 denote expectation under f_0 and $L_i = \log (f_0/f_i)$, $i = 1, \cdots, K$. Using modest assumptions, two lower bounds for ASN, under f_0, have been shown. Bound 1: $\inf_{\{b_j\}} \max_{1 \leqq i \leqq K} [\sum_{j=1,K} b_j \log (b_j/\alpha_{ij})]/E_0 L_i$, where $\sum_{j=1,K} b_j = 1$ and $b_j > 0$. Bound 2: $[(T^2 - R \log S)^{\frac{1}{2}} - T]^2/R^2$, where R, S, and T are defined for subsets (size two or larger) of the first K positive integers. Let D be such a subset with v members; let $C = \{C_i \mid i \varepsilon D\}$ be a set of v real numbers for which $\sum_{i \varepsilon D} C_i = 0$ and $\sum_{i \varepsilon D} |C_i| = 1$; and let $\Phi(D)$ be the permutations of D with typical member φ (a v-dimensional vector). Then, $R(D) = \max_{i \varepsilon D} E_0 L_i$, $S(D) = \sum_{j=1,K} \min_{i \varepsilon D} \alpha_{ij}$, $T(D) = \inf_C \tau(C)/2v(v-2)!$, where $\tau(C) = \sum_{\varphi \varepsilon \Phi(D)} \tau_\varphi(C)$, and where $\tau_\varphi(C) = E_0[\sum_{i \varepsilon D} C_{\varphi_i}(L_i - E_0 L_i)]^2$. The latter bound is really several bounds when $K > 2$ (one for each subset D). For $K = 2$, the latter bound is the same as one given by W. Hoeffding [*Amer. Math. Soc.* **31** (1960) 352–368] and the former is a rather disguised form of one also given by him [*Amer. Math. Soc.* **24** (1953) 127–130]. Subsequent reports will compare these bounds with some sequential tests.

(Abstracts of papers not connected with any meeting of the Institute.)

1. Multivariate two sample normal scores test for shift (preliminary report). Gouri Kanta Bhattacharyya, University of California, Berkeley.

For testing the identity of two multivariate populations against shift alternatives an asymptotically distribution-free test is proposed using the normal scores statistics co-