References

Anderson, T.W. (1946). The noncentral Wishart distribution and certain problems of multivariate statistics. *Ann. Math. Statist.*, **17**, 409-431.

Anderson, T.W. (1958). *An introduction to multivariate statistical analysis.* Wiley, New York.

Anderson, T.W. and Girshick, M.A. (1944). Some extensions of the Wishart distribution. *Ann. Math. Statist.*, **15**, 345-357.

Anderson, T.W. and Mentz, R.P. (1977). The generalized variance of a stationary autoregressive process. *J. Multivariate Anal.*, **7**, 584-588.

Brillinger, D.R. (1975). *Time series: data analysis and theory.* Holt, Rinehart and Winston, New York.

Chikuse, Y. (1981). Distributions of some matrix variates and latent roots in multivariate Behrens-Fisher discriminant analysis. *Ann. Statist.*, **9**, 401-407.

Constantine, A.G. (1963). Some noncentral distribution problems in multivariate analysis. *Ann. Math. Statist.*, **34**, 1270-1285.

Constantine, A.G. (1966). The distribution of Hotelling's generalized T_0^2. *Ann. Math. Statist.*, **37**, 215-225.

Crowther, N.A.S. and DeWaal, D.J. (1973). On the distribution of a generalised positive semidefinite quadratic form of normal vectors. *South African Statist. J.*, **7**, 119-127.

David, F.N., Kendall, M.G., and Barton, D.E. (1966). *Symmetric function and*

allied tables. Cambridge University Press.

Davis, A.W. (1979). Invariant polynomials with two matrix arguments extending the zonal polynomials: applications to multivariate distribution theory. *Ann. Inst. Statist. Math.,* **31,** 465-485.

Davis, A.W. (1980). Invariant polynomials with two matrix arguments, extending the zonal polynomials. In *Multivariate Analysis-V,* P.R. Krishnaiah, ed. North-Holland.

Davis, A.W. (1981). On the construction of a class of invariant polynomials in several matrices, extending the zonal polynomials. *Ann. Inst. Statist. Math.,* **33,** 297-313.

DeWaal, D.J. (1970). Distributions connected with a multivariate beta statistics. *Ann. Math. Statist.,* **41,** 1091-1095.

DeWaal, D.J. (1972). An asymptotic distribution of noncentral multivariate Dirichlet variates. *South African Statist. J.,* **6,** 31-40.

DeWaal, D.J. (1973). On the elementary symmetric functions of the Wishart and correlation matrices. *South African Statist. J.,* **7,** 47-60.

Farrell, R.H. (1976) *Techniques of multivariate calculation.* Vol.520, Lecture Notes in Mathematics, Springer-Verlag, Berlin.

Farrell, R.H. (1980). Calculation of complex zonal polynomials. In *Multivariate Analysis-V* (P.R.Krishnaiah, ed.), North-Holland, pp. 301-320.

Gantmacher, F.R. (1959). *The theory of matrices, Vol. I.* Chelsea, New York.

Goodman, N.R. (1963). Statistical analysis based on a certain multivariate complex Gaussian distribution (an introduction). *Ann. Math. Statist.,* **34,** 152-177.

Halmos, P.R. (1974). *Measure Theory.* Springer, New York.

Hayakawa, T. (1966). On the distribution of a quadratic form in a multivariate normal sample. *Ann. Inst. Statist. Math.,* **18,** 191-201.

Hayakawa, T. (1967). On the distribution of the maximum latent root of a positive definite symmetric random matrix. *Ann. Inst. Statist. Math.,* **19,** 1-17.

Hayakawa, T. (1969). On the distribution of the latent roots of a positive definite random symmetric matrix I. *Ann. Inst. Statist. Math.*, **21**, 1-21.

Hayakawa, T. and Kikuchi, Y. (1979). The moments of a function of traces of a matrix with a multivariate symmetric normal distribution. *South African Statist. J.*, **13**, 71-82.

Helgason, S. (1962). *Differential geometry and symmetric spaces.* Academic Press, New York.

Herz, C.S. (1955). Bessel functions of matrix argument. *Ann. Math.*, **61**, 474-523.

Hua, L.K. (1959). *Harmonic analysis of functions of several complex variables in the classical domains.* Moscow. (English translation: Amer. Math. Soc., Providence, R.I.)

James, A.T. (1954). Normal multivariate analysis and the orthogonal group. *Ann. Math. Statist.*, **25**, 40-75.

James, A.T. (1955a). The noncentral Wishart distribution. *Proc. Roy. Soc. (London), A,* **229**, 364-366.

James, A.T. (1955b). A generating function for averages over the orthogonal group. *Proc. Roy. Soc. (London), A,* **229**, 367-375.

James, A.T. (1960). The distribution of the latent roots of the covariance matrix. *Ann. Math. Statist.*, **31**, 151-158.

James, A.T. (1961a). Zonal polynomials of the real positive definite symmetric matrices. *Ann. Math.*, **74**, 456-469.

James, A.T. (1961b). The distribution of noncentral means with known covariances. *Ann. Math. Statist.*, **32**, 874-882.

James, A.T. (1964). Distribution of matrix variates and latent roots derived from normal samples. *Ann. Math. Statist.*, **35**, 475-501.

James, A.T. (1968). Calculation of zonal polynomial coefficients by use of the Laplace-Beltrami operator. *Ann. Math. Statist.*, **39**, 1711-1718.

James, A.T. (1973). The variance information manifold and the functions on

it. In *Multivariate Analysis-III* (ed. P.R.Krishnaiah). Academic Press, New York.

Johnson, N.L. and Kotz, S. (1972). *Distributions in statistics: continuous multivariate distributions*. Wiley, New York.

Kates, L.K. (1980). Zonal polynomials. Ph.D. dissertation, Princeton University.

Khatri, C.G. (1966). On certain distribution problems based on positive definite quadratic functions in normal vectors. *Ann. Math. Statist.*, **37**, 468-479.

Khatri, C.G. (1967). Some distribution problems connected with the characteristic roots of $S_1 S_2^{-1}$. *Ann. Math. Statist.*, **38**, 944-948.

Khatri, C.G. (1972). On the exact finite series distribution of the smallest or the largest root of matrices in three situations. *J. Multivariate Anal.*, **2**, 201-207.

Khatri, C.G. and Pillai, K.C.S. (1968). On the noncentral distribution of two test criteria in multivariate analysis of variance. *Ann. Math. Statist.*, **39**, 215-226.

Krishnaiah, P.R. and Chang, T.C. (1971). On the exact distribution of the smallest root of the Wishart matrix using zonal polynomials. *Ann. Inst. Statist. Math.*, **23**, 293-295.

Kshirsagar, A.M. (1959). Bartlett decomposition and Wishart distribution. *Ann. Math. Statist.*, **30**, 239-241.

Kushner, H.B. and Meisner, M. (1980). Eigenfunctions of expected value operators in the Wishart distribution. *Ann. Statist.*, **8**, 977-988.

Kushner, H.B., Lebow, A., and Meisner, M. (1981). Eigenfunctions of expected value operators in the Wishart distribution, II. *J. Multivariate analysis*, **11**, 418-433.

Lehmann, E.L. (1959). *Testing statistical hypotheses*. Wiley, New York.

Littlewood, D.E. (1950). *The theory of group characters and matrix representations of groups*. Clarendon, Oxford.

Loomis, L.H. (1953). *An introduction to abstract harmonic analysis.* D. Van Nostrand, New York.

Macdonald, I.G. (1979). *Symmetric functions and Hall polynomials.* Oxford Mathematical Monographs, Clarendon Press, Oxford.

Mardia, K.V., Kent, J.T., and Bibby, J.M. (1979). *Multivariate Analysis.* Academic Press, New York.

Marshall, A.W. and Olkin, I. (1979). *Inequalities: theory of majorization and its applications.* Academic Press, New York.

Mirsky, L. (1955). *An introduction to linear algebra.* Oxford University Press.

Muirhead, R.J. (1982). *Aspects of multivariate statistical theory.* Wiley, New York.

Nachbin, L. (1965). *The Haar integral.* Litton Education Pub., Inc.

Nagarsenker, B.N. (1978). Nonnull distribution of some statistics associated with testing for the equality of two covariance matrices. *J. Multivariate Anal.,* **8,** 396-404.

Olkin, I. and Perlman, M.D. (1980). Unbiasedness of invariant tests for MANOVA and other multivariate problems. *Ann. Statist.,* **8,** 1326-1341.

Parkhurst, A.M. and James, A.T. (1974). Zonal polynomials of order 1 through 12. in *Selected tables in mathematical statistics,* Vol.2. I.M.S. publications.

Pillai, K.C.S. (1967). On the distribution of the largest root of a matrix in multivariate analysis. *Ann. Math. Statist.,* **38,** 616-617.

Pillai, K.C.S. (1975). The distribution of the characteristic roots of $S_1 S_2^{-1}$ under violations. *Ann. Statist.,* **3,** 773-779.

Pillai, K.C.S. (1976). Distributions of characteristic roots in multivariate analysis. Part I. Null distributions. *Can. J. Statist.,* **4,** 157-184.

Pillai, K.C.S. (1977). Distributions of characteristic roots in multivariate analysis. Part II. Non-null distributions. *Can. J. Statist.,* **5,** 1-62.

Pillai, K.C.S., Al-Ani, S., and Jouris, G.M. (1969). On the distributions of the ratios of the roots of covariance matrix and Wilks' criterion for tests of three hypotheses, *Ann. Math. Statist.*, **40**, 2033-2040.

Pillai, K.C.S. and Nagarsenker, B.N. (1971). On the distribution of the sphericity test criterion in classical and complex normal populations having unknown covariance matrix. *Ann. Math. Statist.* **42**, 764-767.

Pillai, K.C.S. and Nagarsenker, B.N. (1972). On the distribution of a class of statistics in multivariate analysis. *J. Multivariate Anal.*, **2**, 96-114.

Pillai, K.C.S. and Sugiyama, T. (1969). Noncentral distributions of the largest latent roots of three matrices in multivariate analysis. *Ann. Inst. Statist. Math.*, **21**, 321-327.

Saw, J.G. (1970). The multivariate linear hypothesis with nonnormal errors and a classical setting for the structure of inference in a special case. *Biometrika*, **57**, 531-535.

Saw, J.G. (1977). Zonal polynomials: an alternative approach. *J. Multivariate Analysis*, **7**, 461-467.

Shah, B.H. (1970). Distribution theory of a positive definite quadratic form with matrix argument. *Ann. Math. Statist.*, **41**, 692-697.

Shorrock, R.W. and Zidek, J.V. (1976). An improved estimator of the generalized variance. *Ann. Statist.*, **4**, 629-638.

Srivastava, M.S. (1968). On the distribution of a multiple correlation matrix: noncentral multivariate beta distributions. *Ann. Math. Statist.*, **39**, 227-232.

Srivastava, M.S. and Khatri, C.G. (1979). *An introduction to multivariate statistics*. North Holland, New York.

Stewart, G.W. (1973). *Introduction to matrix computations*. Academic Press, New York.

Subrahmaniam, K. (1976). Recent trends in multivariate normal distribution theory: on the zonal polynomials and other functions of matrix argument. *Sankhya A*, **38**, Part 3, 221-258.

Sugiura, N. (1971). Note on some formulas for weighted sums of zonal polynomials. *Ann. Math. Statist.,* **42,** 768-772.

Sugiura, N. (1973). Derivatives of the characteristic root of a symmetric or a Hermitian matrix with two applications in multivariate analysis. *Communications in Statistics,* **1,** 393-417.

Sugiura, N. and Fujikoshi, Y. (1969). Asymptotic expansions of the non-null distributions of the likelihood ratio criteria for multivariate linear hypothesis and independence. *Ann. Math. Statist.,* **40,** 942-952.

Sugiyama, T. (1966). On the distribution of the largest latent root and the corresponding latent vector for principal component analysis. *Ann. Math. Statist.,* **37,** 995-1001.

Sugiyama, T. (1967a). On the distribution of the largest latent root of the covariance matrix. *Ann. Math. Statist.,* **38,** 1148-1151.

Sugiyama, T. (1967b). Distribution of the largest latent root and the smallest latent root of the generalized B statistic and F statistic in multivariate analysis. *Ann. Math. Statist.,* **38,** 1152-1159.

Towber, J. (1981). Personal communication.

Weyl, H. (1946). *The classical groups.* Princeton University Press, Princeton, N.J.

Wijsman, R.A. (1959). Application of a certain representation of the Wishart matrix. *Ann. Math. Statist.,* **30,** 597-601.

Zidek, J. (1978). Deriving unbiased risk estimators of multinormal mean and regression coefficient estimators using zonal polynomials. *Ann. Statist.,* **6,** 769-782.