Ann. Inst. Statist. Math. Vol. 42, No. 1, 99-114 (1990)

## NONPARAMETRIC TEST OF RESTRICTED INTERCHANGEABILITY

## GEORGE R. JERDACK<sup>1</sup> AND PRANAB KUMAR SEN<sup>2</sup>

 <sup>1</sup>The Procter and Gamble Company, Miami Valley Laboratories, P.O. Box 39175, Cincinnati, OH 45247, U.S.A.
<sup>2</sup>Department of Biostatistics, School of Public Health, The University of North Carolina, CB# 7400, Rosenau Hall, Chapel Hill, NC 27599-7400, U.S.A.

(Received March 22, 1988; revised April 3, 1989)

Abstract. Exact and large sample distributions of the rank order test under the null hypothesis of restricted interchangeability are obtained. Under given regularity conditions and under Pitman's shift in location alternative, the asymptotic relative efficiency of this nonparametric test in comparison with Votaw's (1948, Ann. Math. Statist., 19, 447-473) likelihood ratio test is given.

Key words and phrases: Interchangeability, Pitman's shift in location alternative, asymptotic relative efficiency, likelihood ratio test, asymptotic normality, permutational distribution.