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MAXIMUM LIKELIHOOD ESTIMATION OF THE PARAMETERS OF THE TYPE XI DISTRIBUTION FOR GROUPED DATA

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ABSTRACT

Silcock (1954) proposed the Type XI distribution for modeling the number of leavers by completed length of service in a manpower system. In estimating the parameters using the method of maximum likelihood for grouped data, he applied arbitrary correction factors to the estimating equations for ungrouped data. In order to solve the problem of choice of correction factors, this paper derives from the first principle, the maximum likelihood estimating equations as well as the variances and covariance of the estimators of the parameters. The performance of the estimators are compared with those obtained based on the method of percentage points, using the data on the number of leavers by completed length of service in company *X,* 1971 cohort (Bartholomew and Forbes, 1979; p.16) and in Glacier Metal Company, 1944-47 cohort (Silcock, 1954). It was found that in the two examples, the estimates based on the method of percentage points provided more satisfactory fits. Nonetheless, the method of maximum likelihood provides a basis for assessing the reliability of the estimates. The variances of the estimates are quite small attesting to their reliability.

Key words: Parameters, type XI distribution grouped data, maximum likelihood estimation