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BOOK REVIEWS

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FRANK A. HAIGHT. *Handbook of the Poisson Distribution.* John Wiley & Sons, 1967. xi + 168 pp. $9.50.

Review by NORMAN L. JOHNSON

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This book contains a considerable amount of information about the Poisson distribution and many topics related thereto. These include a number of generalizations of the Poisson distribution and applications in many different fields. There is no doubt that this book will prove useful as a reference source.

It is, perhaps, to be expected that in such a wide-ranging work there should be marked differences in excellence in different parts. The author has succeeded in maintaining a good level generally, throughout the book. Although there are some lapses, to be noted in the next paragraph, they are local in nature. However, it is unfortunate they exist, especially in a work which is likely to be used for occasional reference, as well as a text to be read through continuously.

The lapses are of two kinds—one appearing to arise from carelessness, and the other from inadequate judgement. Among the first kind are (i) the statement that for (all) Poisson distributions $\beta_1 = 1$ and $\beta_2 = 4$ (page 12) (ii) the reference to Kendall and Buckley (page 41) which should be Kendall and Buckland and perhaps (iii) the lower limit $j = 0$ in the summation at the foot of page 45 (which would be better as $nj \geqq x$). Among instances of lack of judgement may be noted (i) a list of formulae (on pages 10–11) among which there are 15 of form $\sum x^r \Delta^s p_x = 0$ with $r < s$, without noting that this is true for *any* r and s, with $r < s$, (ii) a reference (page 6) for the formula for the kth moment of a Poisson distribution

$$\textstyle\sum_{i=1}^{k} (\Delta^i 0^k)(\lambda^i / i!)$$

to a 1960 Polish paper, when this result had been known at least 10 years before this date, (iii) an integral formula (page 3)

$$\textstyle\int_0^\infty \{ \sum_{j=0}^{x-1} (\lambda t)^j / j! \} \, e^{-\lambda t} \, dt = x/\lambda$$

followed a few lines later by,

$$\textstyle\int_0^\infty (\lambda t)^j (j!)^{-1} e^{-\lambda t} \, dt = 1/\lambda$$

without a note that the former can be derived from the latter, and (iv) a reference (page 74) to a 1956 Spanish paper as the source of formulae for the cumulants of the difference between two independent Poisson variables.

A misprint which might cause confusion is $X(t)$ for $N(t)$ (above (3.6–21) on page 46). Some confusion may also arise from the omission to state that the maximum likelihood estimator in (5.3–19) on page 89 is based on an approximation.

Especially interesting chapters are those on models leading to the Poisson distribution and on historical matters. To this reviewer, at any rate, each of these chapters, in its own way, opened new perspectives in appreciation of the place of Poisson distributions and processes in statistical work.

There is a lengthy bibliography which must approach exhaustiveness in regard to papers with any important discussion of Poisson-related matters. The descriptive catalogue of tables in Chapter 8 is another valuable feature of the book.