Computer and language. Corrections were made on the CDC 6500 version of EDSTAT-P, written in FORTRAN IV. The corrected program has been successfully tested on a CDC 6500 using examples from Winer's text.

Availability. Since EDSTAT-P is copyrighted, the author cannot supply the entire program. A partial listing indicating the necessary corrections is available free of charge from William L. Bache III, Parent-Child Development Center, 3300 Freret Street, New Orleans, Louisiana 70115.

REFERENCE

Winer, B. J. *Statistical principles in experimental design* (2nd ed.). New York: McGraw-Hill, 1971.

RBIS: Point-biserial to biserial correlation conversion

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Researchers having occasion to correlate naturally dichotomous variables with continuous, normally distributed variables can take advantage of a number of Pearson product-moment routines, since these routines do in fact yield a point-biserial correlation when one variable is a natural dichotomy. When, however, a normally distributed continuous variable is artificially dichotomized, biserial correlation is the appropriate statistic, and computational routines are less conveniently accessible. Often, pseudodichotomous variables in a data base must be analyzed separately by the use of ad-hoc routines written specifically for this purpose. Obviously, it would be more efficient to be able to deal with the data base as a whole—carrying out data analysis as much as possible with a single, comprehensive statistical package (such as SPSS, OSIRIS, etc.), and minimizing the necessity of dealing with discrete segments. Rather than compute biserial correlations directly from the raw data, therefore, it would usually be more convenient to proceed with the generation of product-moment correlation matrices, extract from these the point-biserial correlations involving pseudodichotomous variables, and then convert these to the required biserial coefficients. RBIS

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accomplishes this conversion while minimizing the amount of input preparation.

Remarks. (1) The resultant biserial correlation is always larger than the point-biserial coefficient, and the degree of adjustment is a function of the difference in the proportions (p and q) of the sample in the two categories of the dichotomy. [$r_{bis} = r_{pbis}(\sqrt{p \cdot q}/y)$, where y is the ordinate of the unit normal curve at the point of division $p:q$.] One assumption in the use of biserial correlation is that a normally distributed variable underlies the dichotomy. Departure from this condition may be indicated by extreme disparity between p and q , and can result in inflated biserial correlations—even coefficients $>+1$ or <-1 . (Ferguson, 1966; Walker & Lev, 1953). (2) Ferguson (1966) provides a formula for computing the standard error of r_{bis} , and this parameter is output by RBIS. If the sample size is large, $SE_{r_{bis}}$ may be used to obtain z transformations to test the significance of a biserial coefficient. As Ferguson warns, however, this should be done with caution, since "the probabilities thereby obtained are somewhat inaccurate." For this reason, a significance test is not included in the RBIS output.

Input. One card is required for each point-biserial coefficient to be converted. It contains the coefficient and the number of cases in each category of the dichotomized variable. There is no restriction on the number of coefficients which may be converted in a given run.

Output. (1) The proportions of cases in each category of the dichotomy. (2) The ordinate of the unit normal curve at the point of division $p:q$. (3) The biserial coefficient and its standard error and the original point-biserial coefficient.

Computer and language. RBIS is written in CDC FORTRAN IV and has been successfully tested on a CDC 6500. Conversions to other systems may be considered without undue concern regarding accuracy, since normal curve ordinates are obtained via table look-ups.

Availability. User's documentation, program listing, sample output, and source deck may be obtained free of charge from William L. Bache III, Parent-Child Development Center, 3300 Freret St., New Orleans, Louisiana 70115.

REFERENCES

- Ferguson, G. L. *Statistical analysis in psychology and education*. New York: McGraw-Hill, 1966 (2nd ed.).
Walker, H. M., & Lev, J. *Statistical inference*. New York: Holt, Rinehart, and Winston, 1953.