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Tom Swift and his electric regression analysis machine: 1973

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Tom Swift, who began his career with factor analysis (1967) , is pleased to announce that the "1973 Tom Swift Award for Data Abuse" has been won by LeRoy Stone and James Brosseau. They originally (Stone, *et al.,* 1973) used 115 variables in a stepwise regression analysis to explain differences among 19 observations. They then claimed (Stone & Brosseau, 197 3) to have tested the predictive validity of this model. This was done by regressing the 14 variables from the model on data from 18 new subjects. This "cross-validation" yielded a final model with six variables and an R^2 of 0.76.

They went beyond the call of duty by collecting all of these data since comparable results could have been obtained with random data (Ando & Kaufman, 1966; Armstrong, 1970) . This may be shown also as follows. Assuming that there was *no* relationship, the calculated R^2 from 18 observations with 14 variables can be obtained from (Montgomery & Morrison, 1973):

$$R^2 = k/n$$

where *k is* the number of independent variables and *n* is the number of observations. Thus, expected R^2 would be 0.78 if all 14 variables were included, and close to this if only the best six variables were included. The R^2 obtained by Stone and Brosseau (1973) was, of course, less than this at 0.76. The evidence, then, did *not* support their conclusion that the model would ". . . quite accurately predict success of trainees . . .".

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