Reprinted from the American Statistician June 1970, Vol. 24, No. 3, p. 27.

Dear Sir:

Haitovsky [2] proved that the \overline{R}^2 can be increased by discarding a variable whose *t* value is smaller than unity. He further suggested sequential deletion of the independent variables whose associated *t* statistics are smaller than unity for maximizing \overline{R}^2 . This procedure is necessary but not sufficient for maximizing \overline{R}^2 . The following numerical example demonstrates that when more than one variable is discarded, \overline{R}^2 can be increased even though the *t* values corresponding to these variables are larger than unity. As shown by Edwards [1] the necessary and sufficient condition is the relevant F value.

The data corresponds to 22 observations and the correlation matrix of all the variables is:

	x1	x2	xЗ	x4
у	.3418	.7430	.5826	8258
x1		.7982	.1971	4206
x2			.3674	8443
xЗ				3337

The two regression equations fitted to the above data are:

y = -0.60 x1 + 0.89 x2 + 0 23 x3 - 0.29 x4 \bar{R}^2 = 0.7631 (1) [-1.30] [1.31] [2.62] [-1.02] y = 0.26 x3 - 0.62 x4 \bar{R}^2 = 0.7658 (2) [3.08] [-6.34]

The figures in the parentheses are the *t* values. Haitovsky's procedure would lead to the conclusion that in equation (1) \overline{R}^2 cannot be increased by deleting any of the variables. By deleting variables xl and x2 we obtained higher \overline{R}^2 in equation (2).

Sincerely Potluri Rao Dept. of Economics University of Washington Seattle, Washington

REFERENCES

- [1] Edwards, J. B., "The Relation between the F-test and R²," The American Statistician, Vol. 23, No. 5, (December, 1969), p. 28.
- [2] Haitovsky, Y., "A Note on the Maximization of R^2 The American Statistician, Vol. 23, No. 1, (February, 1969), pp. 20-21.