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Comment: Who Will Solve the Secretary Problem?

Stephen M. Samuels

Just like Johannes Kepler, who threw a new curve at the solar system, Tom Ferguson has given a different slant to the Secretary Problem. To its many practitioners who ritually begin by saying "all that we can observe are the relative ranks," Ferguson (citing historical precedent), in effect, responds "let's not take that assumption for granted." The heart of his paper, as I see it, is the following *Ferguson Secretary Problem*:

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Given n, either find an *exchangeable* sequence of continuous random variables, $X_1, X_2, \cdots, X_n$, for which, among all stopping rules, τ, based on the X's,

$$\sup_\tau P\{X_\tau = \max(X_1, X_2, \cdots, X_n)\}$$

is achieved by a rule based only on the *relative ranks* of the X's—or prove that no such sequence exists.

Ferguson has come within *epsilon* of solving this problem. He has exhibited exchangeable sequences, for each n and $\varepsilon > 0$, such that the best rule based only on relative ranks has success probability within ε of the supremum. But he has left open the question of whether this supremum can actually be attained.

For $n = 2$, the answer is easy; there is no such sequence. The following elementary argument, which