Let .

Treat these as draws, rounded down, from an distribution.

Call the CDF .

Solve the max-likelihood equation

The R optimization function gives the MLE as .

If , then , and .

Even though the MVN model assumes that is conditionally normal, not marginally normal, we still hope that making it marginally normal will provide a better fit.

Let and denote standard normal CDF and PDF.

Let .

To find the inverse, solve for in terms of :

.

So ,

,

.

Call this last function .

By the change of variables,

.

Let denote the log-likelihood of the total parameter vector given . Then

.

If we fit model 1 to the ’s (untransformed MMSE values) and model 2 to the ’s (transformed MMSE values), can we compare

from model 1,

from model 2?

, and

Also, ,

so .