

20th February, 1951.

My dear Smith,

I have been thinking about your letter of February 15th, and so far as I can recall, no one has published on such a test as you require.

The problem is necessarily rather a messy one, since, as soon as variations between sub-classes is recognised as significant, the sub-class means have no longer weights proportional to their membership, but of the form $w = 1/(\alpha + \beta/n)$. I think the right way is to work with provisional weights of this kind and values of $\hat{\sigma}^2$ derived from intra-sub-class comparisons, so that \hat{L} is a well defined likelihood function approximate, or if necessary, exact in the neighbourhood of this optimum.

Of course, the precision will depend upon $\hat{\sigma}^2$ but the fact that $\hat{\sigma}^2$ may be different in two analogous cases in which the values of \hat{L} are to be compared, does not seem to disturb the comparison more than other circumstances such as different numbers in the sub-classes.

Sincerely yours,