26hh April, 1935

Whately Carington Esq.,
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Dear Whately Carington.

I am afraid I am answering your letters in the wrong order. This is the one you wrote on April 23rd.

I think you have carried out the calculations exactly as should be done. Nevertheless, there is a snag in the interpretation of the comparison on page 2 where there seems to be some real discrepancy, due to the occurrence of 3 observers giving exactly the right number of correct guesses, whereas the χ distribution has only 1% of its frequency below the value .000157.

The point I want you to consider is this;

For each observer you have taken a number of guesses divisible by 6; consequently the number correct is either exactly equal to expectation, or differs by 1, 2, etc. units above or below. For example: observer No. 36 makes 120 guesses. If he had 19 or 21 right, his χ^2 would be .05; having 20 right, his value is exactly zero. In fact, apart from zero, his χ^2 cannot take any value below .05. The same sort of thing is true of the others, and in consequence there is an accumulation of χ^2 values at exactly zero, in

comparison with the theoretical distribution of the 8 values
expected below .0642. In fact, below .0158, you have 5 observa-
tions where 4 are expected, and what is exceptional about your
distribution is only that 3 out of the 5 should be absolutely
zero.

The rough safe-guard in interpretation which I suggested
in my book, is to amalgamate the smaller frequency classes into
groups having expectations of not less than 5. If we relax this
restriction so as to take an expectation of 4 in each tail of
your table, we have for 8 classes or 7 degrees of freedom, only
a total of 11.875 instead of 33.3 75, which is by no means
aberrant..

Yours sincerely,