Correspondence Section

Limitations of the Pearson product-moment correlation


My appreciation was, however, diminished by Fig. 2. An Editorial Review is a prestigious article and it was a disappointment to see it contain such weak statistical treatment. The limitations of the Pearson product-moment correlation have been reviewed recently [1], so its misapplication to data which were at least non-parametric, if not discontinuous, was sad. The quoting of a regression line equation in the legend to the Figure was similarly inappropriate. If there is doubt as to the normality of a distribution, the Shapiro–Wilk test is available.

If one believed that the data were continuous, a Spearman correlation would have been acceptable. The data in Fig. 2 apparently had the more severe problem of being frankly discontinuous. In doubtful cases, tests for bimodality or cluster analysis can help decide. If the data are discontinuous, then no correlation test should be used. The argument is that one is looking at two or more groups which are samples drawn from different populations such as mice and rats or mice and guinea pigs. If one then seeks a ‘correlation’ between tail length and weight of rodent, the ‘correlation’ will depend entirely on whether one compares mice with rats, or mice with guinea pigs. It would be more appropriate to use Mann–Whitney tests and say that the animals were different in respect of both tail size and body weight.

Regrettably, other workers have made similar oversights recently, e.g.


