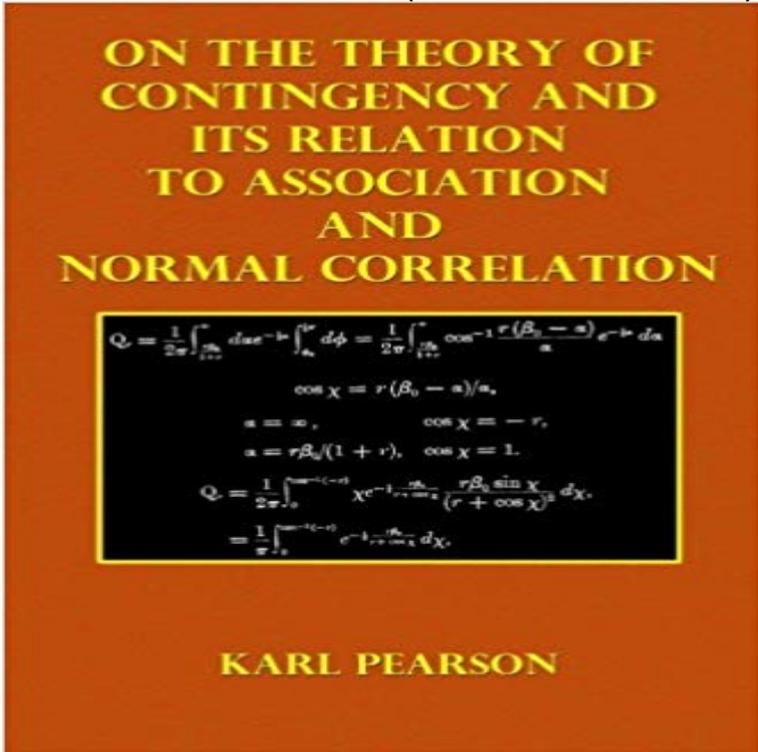# On the Theory of Contingency: and Its Relation to Association and Normal Correlation (Biometric Series) (Volume 1)

An excerpt from the beginning of the INTRODUCTION: In dealing with the problem of the relationship of attributes, not capable of quantitative measurement, it has been usual to classify the two attributes into a number of groups, A1, A2, A3, . . . As and B1, B2, B3, . . . Bt. In this manner a table has been formed containing s columns and t rows, or s x t compartments. The total frequency of the population, or of the universe under consideration, to use the logicians phrase, is then distributed into sub-groups corresponding to these s x t compartments. In simple cases of association, as in that of the presence of the vaccination cicatrix and the recovery from an attack of smallpox, s and t are both equal to two, and we have a simple four-fold division of the universe. In other cases we have higher numbers, as when we classify the human eye into eight colour classes and correlate these classes with six or more classes for hair colour. We may even run up to as many as 18 to 25 classes for each attribute when we table the coat colours of thoroughbred horses or pedigree dogs in the case of pairs of blood relatives. Hitherto, in order to obtain a measure of the degree of correlation or association, we have proceeded on the assumption that it was necessary to arrange the system of classes like A1, A2, ... As in some order, which corresponded to a real quantitative scale in the attribute, although we were unable to use this scale directly. Thus one arranged eve-colours in what appeared to correspond to a scale of varying amounts of orange pigment; the coat colours of horses were arranged in an order corresponding fairly to what an artist would call their value. I even analysed hair tints by photographic processes. In all such cases the order seemed of vital importance. Once this order was settled, the methods of my memoir on the correlation of characters not quantitatively measurable could be appliedthe actual scale corresponding to

the classification could be deduced, and we were able, on the assumption of normal frequency, to actually plot the regression lines for the correlation of a variety of attributes. The conception, however, of order in the classification was at times very hampering. Take three broad classes like those for human temper quick tempered, good natured, and sullen; it is difficult to grasp the exact meaning of a quantitative scale at the basis of this classification, and it is not obvious that the right order is necessarily that with good-natured in the middle. Or, again, take the case of human hair; omitting the brown reds, we can get a practically continuous series of shades from jet black to flaxen, and from flaxen with increasing red up to the deepest reds. Only the brown reds come in and upset the system! We seem, therefore, forced to take a double scale, first one of black, and then one of red pigment. Or, again, take the coat colour of greyhounds; these are classified into as many as 40 fairly narrow groups, and we can arrange these groups in ascending order of red, or black, or other pigmentation. We have more than one possible scale. Now in recent work on such things as temper in man, eye colour in man, and hair colour in man or other animals, I have proceeded to arrange my groups in two or three different orders, and to calculate the correlation on the basis of these different orders. The results for the different orders came out in rather striking agreement, and the first sort of conclusion that one was tempted to draw was, for example, that the inheritance of pigmentation was strikingly alike for all pigments.

Local times of stochastic processes with positive definite bivariate expected values of 1 or more, use of the log-likelihood statistic is preferred over the chi-squared .. Cells of the table in bold font show where the Cochran rule is true. . International Journal of Corpus Linguistics, Vol. On the theory of contingency and its relation to association and normal correlation. Biometric Series No. **Multiway Contingency Tables Analysis for the Social Sciences - Google Books Result** Biometrics Series, I. University College,. London. (On the theory of contingency and its relation to association and normal correlation.) [I4] Pearson, K. (1909). O Neill, M.E.: A note on the canonical correlations from contingency tables. theory of evolution XIII: On the theory of contingency and its relation to association and normal correlation. Drapers Co. 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