Availability: This program has been run on an ICL 4/50, a machine similar to the RCA Spectra 70/45. A source listing together with printouts of sample data and results is available from the author: Chris N. French, Psychology Department, The University, Gandy Street, Exeter, England.

Reference:

Attneave, F. *Applications of information theory to psychology.* New York: Holt, Rinehart & Winston, 1959.

A Program to Analyse Binary Sequences to Depth

N. Chris N. French, University of Exeter, England. (CPA 415)

Description: This ALGOL 60 program prints up in a similar form to that given by Attneave (1959) the complete summary table of a sequential analysis of sequential trains of binary elements.

The program is a general one, and if the core store is sufficient, will analyse binary trains of any length to any depth, *N*, where *N* is the length of the longest basic elemental sequence incorporated in the analysis. Multidimensional arrays are simulated using one-dimensional arrays to deal with the frequencies of the basic sequences.

There are four main procedures. At the start of the analysis, the first initialises the array to contain the observed frequency of each basic sequence to zero. The second, which may be called as many times as required, breaks down each new sequence train into the basic sequences and updates the observed frequencies of the basic sequences up to *N* elements in length. When all the trains to be included have been broken down, the third procedure is called. This calculates the expected frequencies of each basic sequence from the observed frequencies of the corresponding next lower basic sequence on the assumption that the binary elements in the trains form an independent stochastic process. It also calculates the Chi-square value for each sequence length from 1 to *N* from the expected and observed frequencies. A fourth procedure prints out the table giving the observed and expected frequencies, and the Chi-square values in a tree formation with each basic binary sequence identified by a suitable length sequence of user-supplied characters.