

Good's and Mallows's enumerations of hypotheses of independence: a new proof and a discussion

Petros Hadjicostas*peterhadji1@gmail.com

Abstract. We clarify the kinds of independence hypotheses among n variables that I.J. Good considered in a 1975 paper, and we give a new and more concise proof to his exponential generating function for the total number of such hypotheses. We also examine two questions posed in 1979 by C.L. Mallows about the total number of independence hypotheses among n variables without the restrictions imposed by Good.

References

- [1] L. Comtet, Advanced Combinatorics: The Art of Finite and Infinite Expansions (rev. ed.), Kluwer, 2010.
- S. Dalal and J. Landwehr, Obituary: Colin Mallows 1930-2023, (December 2023), available electronically at https://imstat.org/2023/ 12/15/obituary-colin-mallows-1930-2023/.
- [3] A.P. Dawid, Conditional independence in statistical theory, J. Roy. Statist. Soc. Ser. B, 41 (1979), 1–31.
- [4] S.E. Fienberg, The analysis of cross-classified categorical data (2nd ed.), The MIT Press, 1987.
- [5] I.J. Good, The number of hypotheses of independence for a random vector or for a multidimensional contingency table, and the Bell numbers, Iranian J. Sci. Tech., 4 (1975), 77–83.
- [6] I.J. Good, On the application of symmetric Dirichlet distributions and their mixtures to contingency tables, Ann. Statist., 4 (1976), 1159– 1189.
- [7] I.J. Good, C370. A compromise between credibility and subjective probability, J. Stat. Comput. Simul., 36 (1990), 186–193.
- C.L. Mallows, C48. How many independence hypotheses are there?, J. Stat. Comput. Simul., 9 (1979), 235–236.

Received: 8 July 2023 Accepted: 29 January 2024 Good's and Mallows's enumerations

[9] N. J. A. Sloane, The on-line encyclopedia of integer sequences, available electronically at http://oeis.org.