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Characterizations of probability distributions, by Janos Galambos and Samuel Kotz, Lecture Notes in Math., vol. 675, Springer-Verlag, Berlin-Heidelberg-New York, 1978, viii + 169 pp., $9.80.

Characterization of functions by their properties is a mathematical pursuit of long standing. If one is interested in phenomena in which the observable quantities are subject to chance variation, the most important "functions" are probability distributions which describe the chance variation. The problem of characterization of probability distributions can be described, in general terms, as follows: It is known that a family of distributions $\mathcal{F}$ possesses a certain property $\mathcal{P}$; is it true, conversely, that a distribution has the property $\mathcal{P}$ only if it is a member of $\mathcal{F}$? If so, $\mathcal{P}$ characterizes the family $\mathcal{F}$. This result is then referred to as a "characterization of the ($\mathcal{F}$) distribution", in keeping