
Zbl 042.37601**Chung, Kai Lai; Erdős, Pál***Probability limit theorems assuming only the first moment. I. (In English)***Mem. Am. Math. Soc. 6 (Four papers on probability), 19 p. (1951). [0065-9266]**

Let X_i ($i = 1, 2, \dots$) be independent, identically distributed random variables which assume only integer values and write $P(X = k) = p_k$. The authors consider the following assumptions:

$$(1) \quad \sum_{k=-\infty}^{\infty} |k|p_k < \infty \quad \sum_{k=-\infty}^{\infty} kp_k = 0 \quad (2) \quad \sum_{k=0}^{\infty} kp_k = - \sum_{k=-\infty}^0 kp_k = \infty.$$

They derive the following main results: I. Under either (1) or (2) $\lim_{n \rightarrow \infty} \frac{P\{S_n = a\}}{P\{S_n = a'\}} = 1$ where $S_n = X_1 + X_2 + \dots + X_n$ and a and a' are arbitrary integers. II. Under (1) $P \left\{ \lim_{n \rightarrow \infty} \frac{\sum_{k=1}^n Y_k}{\sum_{k=1}^n Y'_k} = 1 \right\} = 1$ where $Y_k = 1$ if $S_k = a$ and $= 0$ if $S_k \neq a$, and similarly Y'_k for a' .

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Classification:

60F05 Weak limit theorems