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Varieties and Frequencies of Partitioned Factors in Sturmian Words.

The results in mathematical music theory due to Clough and Myerson referred to as Cardinality equals Variety (CV) and Structure yields Multiplicity (SM) correspond to statements about Christoffel words. Sturmian words are the infinite counterparts to Christoffel words, characterized as aperiodic but of minimal complexity, i.e., for all $n \in \mathbb{N}$ there are $n + 1$ factors of length n . Berthé showed that the factors of a given length have at most 3 frequencies (probabilities). In this paper we extend to results on factors under a fixed partitioning (decompositions of factors of length n into concatenations of words whose lengths are given by an ordered partition of n into k parts). Any factor of a Sturmian word thus partitioned into k elements belongs to one of $k + 1$ types. We show how to compute the frequencies of the types. These results recapture CV and SM in the Sturmian word. (Received January 03, 2016)