1023-05-1057 **Alison B Miller*** (`miller5@fas.harvard.edu`), 320 Dunster House Mail Center, Cambridge, MA 02138. *Asymptotic Bounds for Permutations Containing Many Different Patterns.*

We say that a permutation $\sigma \in S_n$ contains a permutation $\pi \in S_k$ as a pattern if some subsequence of σ has the same order relations among its entries as π. We improve on results of Wilf and Coleman that bound the asymptotic behavior of $\mathrm{pat}(n)$, the maximum number of distinct patterns of any length that can be contained in a permutation of length n. We prove that $2^n - O(n^2 2^{n-\sqrt{2n}}) \leq \mathrm{pat}(n) \leq 2^n - \Theta(n2^{n-\sqrt{2n}})$ by estimating the amount of redundancy due to patterns that are contained multiple times in a given permutation. This settles a conjecture of Bóna by showing that $\lim_{n\to\infty} \frac{\mathrm{pat}(n)}{2^n} = 1$. We also consider the question of superpatterns, which are permutations that contain all patterns of a given length k. We give a simple construction that shows that L_k, the length of the shortest k-superpattern, is at most $\frac{k(k+1)}{2}$. This may lend evidence to a conjecture of Eriksson et al. that $L_k \sim \frac{k^2}{2}$. (Received September 24, 2006)