1068-05-142 **Jerrold R. Griggs*** (griggs@math.sc.edu), Department of Mathematics, University of South Carolina, Columbia, SC 29212, **Wei-Tian Li**, Department of Mathematics, University of South Carolina, and **Linyuan Lu**, Department of Mathematics, University of South Carolina. *Harp-free Families of Subsets.*

Given a finite poset P, we consider the largest size $\mathrm{La}(n, P)$ of a family of subsets of $[n] := \{1, \ldots, n\}$ that contains no subposet P. A theorem of Erdős (1945) gives that $\mathrm{La}(n, \mathcal{P}_k) = \Sigma(n, k-1)$, where $\mathcal{P}_k$ is the chain (path) of k elements, and we use $\Sigma(n, m)$ to denote the sum of the m middle binomial coefficients in n. Here we consider forbidding the more general class of *harp posets* $\mathcal{H}(l_1, \ldots, l_k)$ which consists of paths $\mathcal{P}_{l_1}, \ldots, \mathcal{P}_{l_k}$ with their top elements identified and their bottom elements identified. We bound the average number of times a random full chain meets a harp-free family, and discover that if $l_1 > \cdots > l_k \geq 3$, then $\mathrm{La}(n, \mathcal{H}(l_1, \ldots, l_k)) = \Sigma(n, l_1 - 1)$. However, when equal length "strings" are allowed, the problem remains exceedingly difficult, such as for the diamond posets $\mathcal{H}(3, \ldots, 3)$. (Received January 17, 2011)