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Gregory B Sorkin* (sorkin@us.ibm.com), IBM Research, 1101 Kitchawan Road, Yorktown Heights, NY 10598. *The Power of Choice in a Generalized Polya Urn Model*. Preliminary report.

We introduce a “power of choice” Polya urn model, synthesizing two existing models. We fix a set of k urns, each with initial occupancy $n_i = 1$. A well-studied rich-get-richer Polya model would increment urn i with probability proportional to n_i^γ , for some fixed $\gamma > 0$. Here, we choose a set of c urns (without replacement) with probability proportional to $n_1^\gamma \cdots n_c^\gamma$. Then, as in the standard “power of two choices” urn model, we increment one of these c urns which has minimum occupancy.

For all c and k , for $\gamma < 1$, with probability 1 all urn occupancies are asymptotically equal: $n_i/n \rightarrow 1/k$. For $\gamma > 1$ this balanced outcome occurs with probability bounded away from 0, but there is also a positive probability that only some subset S of urns is in asymptotic balance, while the remaining urns have bounded occupancies. In fact, any such outcome (given by a set S , $c \leq |S| \leq k$, and by the final occupancies of the other urns) occurs with probability bounded away from 0. (Received August 07, 2007)