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Marc Harper (dash.fryer@gmail.com), Claremont, CA 91711, and **Dashiell Fryer*** (dashiell.fryer@pomona.edu), 610 North College Ave, Claremont, CA 91711. *Evolutionary Stability in Finite Populations*.

We extend the well-known Lyapunov stability results of evolutionary dynamics to both the Moran process and the Wright Fisher process with mutation. In particular, we show that local maxima of the stationary distribution of the Moran process can be characterized in three equivalent ways: (1) as evolutionarily stable states, suitably generalized; (2) states inducing equality in particular transition probabilities; and (3) as minima of an information-theoretic Lyapunov-like function that is a natural analog of relative entropy (a Lyapunov function for the replicator dynamic). Similar but more subtle results hold for the Wright-Fisher Process. If time allows, we will discuss an extension to evolutionary graph theory. (Received September 07, 2013)