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**Nikolay Strigul\*** ([nstrigul@stevens.edu](mailto:nstrigul@stevens.edu)), Department of Mathematical Sciences, Stevens Institute of Technology, Hoboken, NJ 07030. *Self-organization in socio-biological systems: from individual imitations to complex population patterns.*

Imitation is one of the central processes underlying learning. Although the mechanisms of imitation at the individual level have received considerable attention, the population effects of imitative behavior have scarcely been investigated. I address the problem of self-organization at the population level emerging from imitative behavior between individuals. I have developed an individual based model and its analytically tractable approximation by a system of differential equations. In contrast with the other studies, I do not assume any payoffs related to imitation behavior and the existence of social rank. Individuals are assumed to be of equal rank and to accept opinions of others in proportion to their similarity. The symmetrical structure of interactions induces random drift and development of stable self-organized social groups in both homogeneous and spatially-distributed societies. This type of self-organization may be widely distributed in natural systems involving imitation behavior. For example, this self-organization might be involved in the development of writing patterns and in the origins of dialects and ring species. (Received December 21, 2006)