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**Olivia J. Chu\*** (ochu@princeton.edu), Lewis-Sigler Institute, Princeton University, Princeton, NJ 08544, and **Vitor V. Vasconcelos** and **Corina E. Tarnita**. *Evolutionary Dynamics in a Group Population Structure with Barriers to Group Entry*. Preliminary report.

The evolution of cooperation has been studied in many systems, from bacterial communities to human populations. It is well known that population structure is crucial to a system's dynamics. In human populations, group memberships are critical. Humans often meet and interact with each other due to common group memberships. There exist network-based models to study human dynamics, but they generally do not allow for multiple group affiliations or incorporate barriers to group entry. In this work, we present a framework in which individuals in a group-structured population interact, through an evolutionary game, with those who share their groups. Individuals update stochastically, with strategy and group memberships subject to evolutionary updating. We impose realistic barriers to group entry based on group size. We find that with barriers, cooperation can emerge, but that it is most favored when we allow for the existence of "loners": a changing subset of individuals who spend a temporary "time-out" period not interacting with others. This work provides an analytical framework in which behavior in realistic population structures can be studied, and adds to a growing body of literature that recognizes the existence of loners as vital parts of systems. (Received September 17, 2019)