

This dissertation begins with a comprehensive review of the evolutionary biological debate over the evolution of altruism and a discussion of how various models of mechanism have influenced the models of circumstance that paleoanthropologists continue to use in reconstructing details about the level of cooperation displayed by early hominin societies. The remainder of the dissertation concerns itself with systematically exposing previously unquestioned assumptions to potential falsification as well as with exploring some new scenarios concerning the evolution and landscape archaeology of Plio-Pleistocene hominin food sharing, all via a null agent-based model called SHARE. This heuristic model was built to address two major questions: (1) What range of ecological and social conditions facilitates the evolution of food sharing in artificial Plio-Pleistocene hominin populations and (2) Is food sharing at central places necessary for the formation of the so-called “scatter and patches” archaeological landscapes that are characteristic of the Plio-Pleistocene record in East Africa? In answer to the first question, population-level genetic results collected from artificial societies of hominin agents demonstrate that the so-called *transitional zone* of ecological patchiness can facilitate the evolution of altruistic food sharing in mixed starting populations, even if foragers lack the ability to remember past interactions or to avoid social cheaters. In answer to the second question, ecological patchiness can affect the movements of simple foragers such that the artificial archaeological landscapes they create display the same spatial signature that characterizes observed Oldowan landscapes. That is, in ecological conditions marked by fragmented food resources, archaeological landscapes composed of both concentrated patches and diffuse scatters can form as a result of solitary foragers using simple routes that are in no way tethered to culturally-defined and culturally-

maintained central places. In the end, SHARE provides new hypotheses about how ecological patchiness could have influenced both the evolution of altruistic food sharing and the structure of Lower Paleolithic archaeological landscapes. The latter can be tested in the field by looking at the relationship between artifact density and the paleoenvironmental characteristics of locales both in which artifacts are abundant *and* from which they are conspicuously absent.