

Multilevel Societies and Hominin Social Evolution: Insights from Hamadryas Baboons

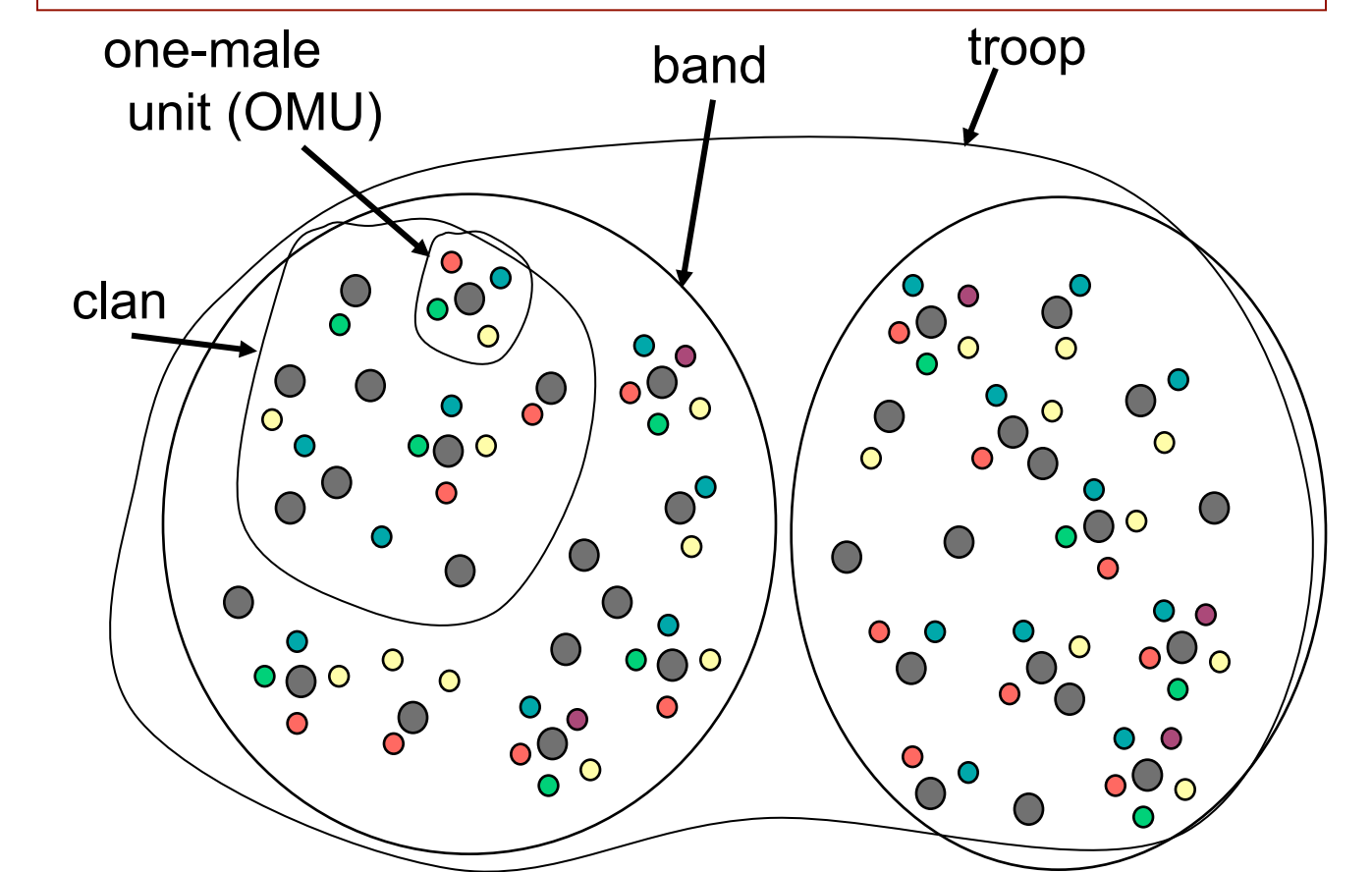
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Multilevel societies facilitate the maintenance of strong and consistent social bonds among some individuals while allowing separation among others, which may be important when social and sexual bonds carry significant and reliable benefits to individuals within social groups. Here we draw parallels between processes thought to characterize the evolution of hamadryas social organization and those thought to characterize late Pliocene or early Pleistocene hominins, particularly *Homo erectus*. The higher costs of reproduction likely faced by *H. erectus* females, exacerbated by an increased reliance on difficult to acquire, nutrient-dense foods, are thought to have been alleviated by a strengthening of male-female bonds (via male provisioning and the evolution of monogamy) or the assistance of older, post-reproductive females (via grandmothering). We suggest that both of these social arrangements could have been present in Plio-Pleistocene hominins if they lived in multilevel societies.



Hamadryas baboon society integrates the **male kin bonding** thought to have characterized early hominins, the **male-female pair bonding** that is thought to have developed at some point during human evolution, and the **female bonding** that underlies the grandmother hypothesis.



A Scenario of Social Evolution in *Homo erectus*:



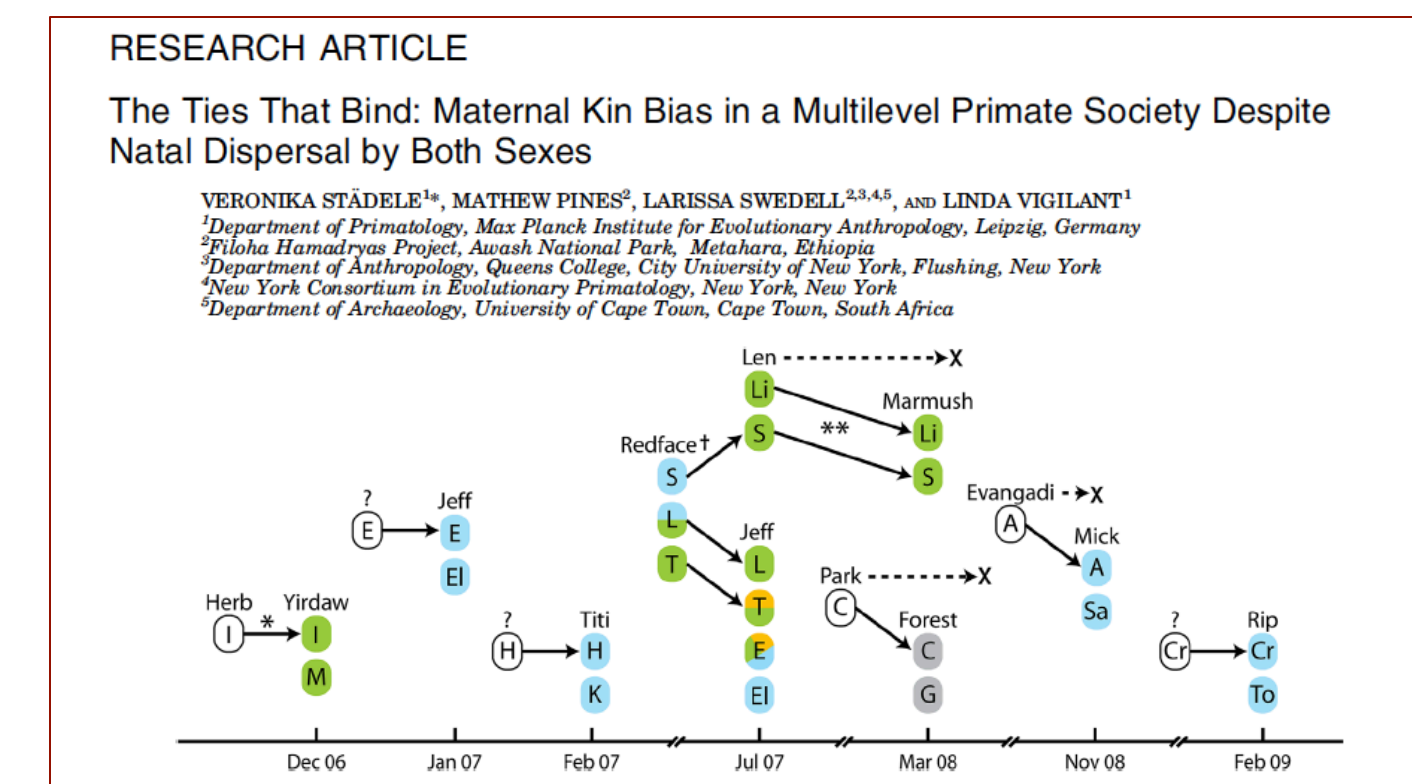
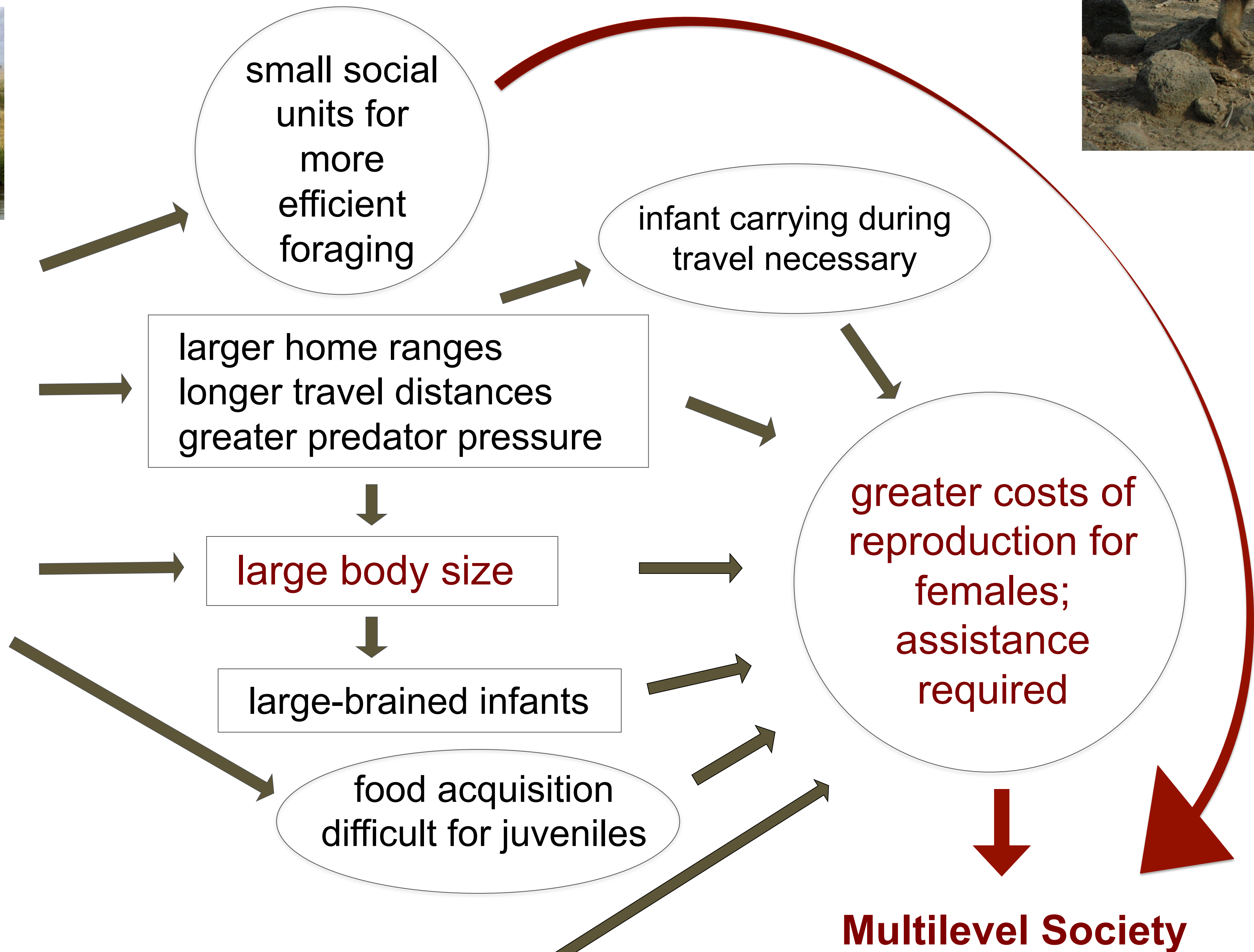
Late Pliocene environmental change

- climate more variable
- more open habitats
- patchier resources
- dispersed foraging
- foods harder to acquire & process



ecological intelligence

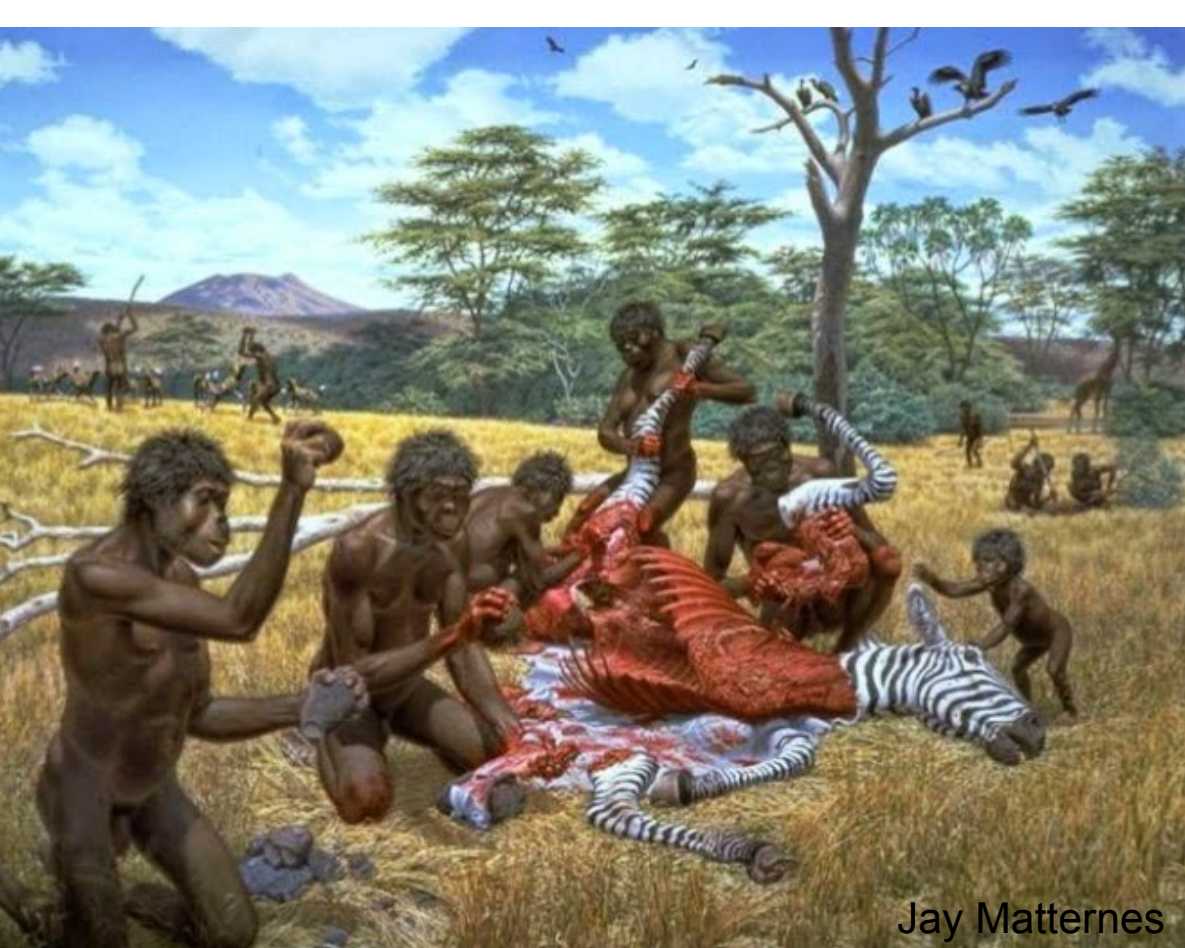
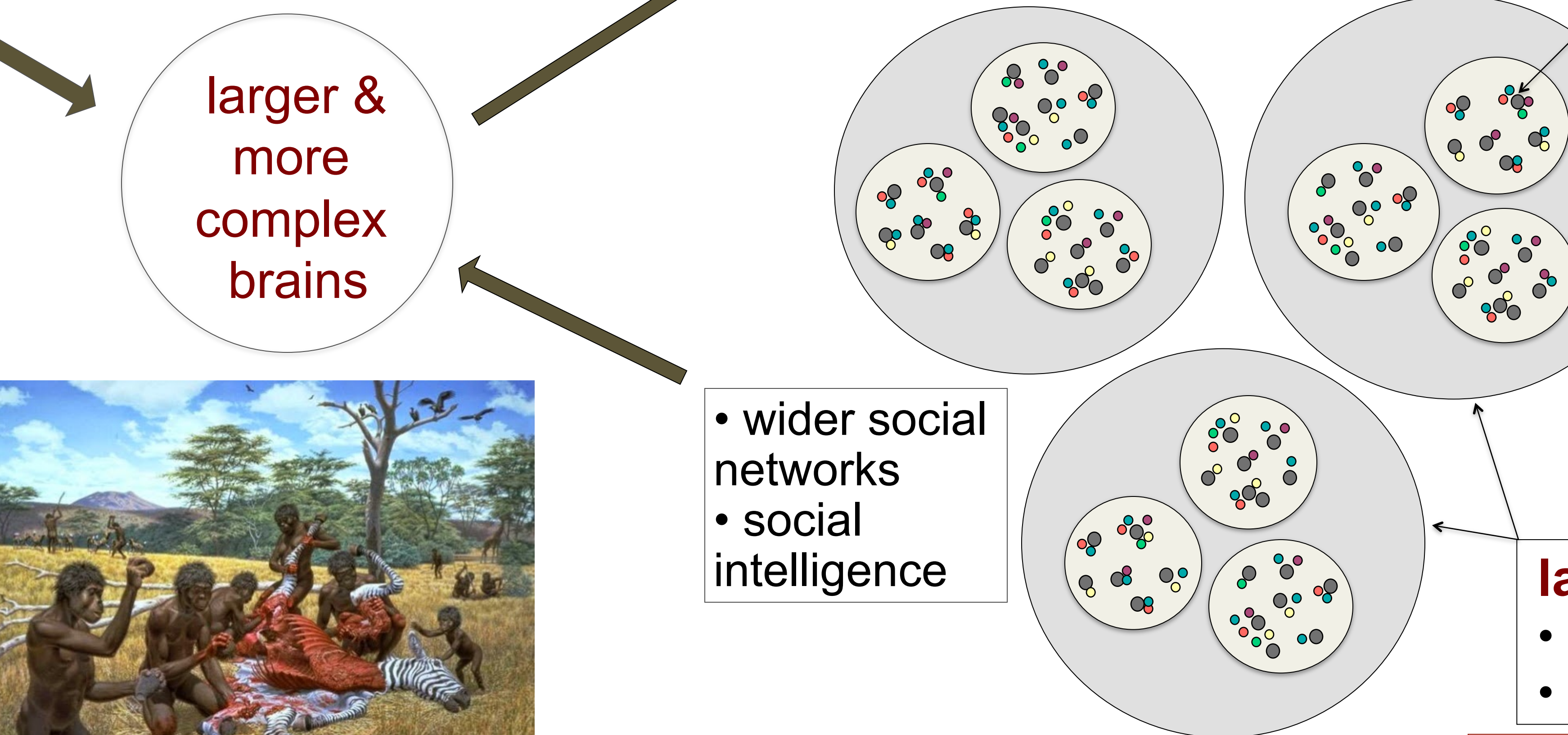
- mental maps
- tool-dependent foraging for nutrient dense foods
 - meat
 - USOs



Hamadryas females “disperse” in that they are moved between OMUs and separated from their maternal kin by males (Kummer 1968; Swedell et al. 2011), yet **accumulating evidence suggests that relationships among hamadryas females are more important than previously thought**. Hamadryas females spend as much social time with other females in their OMUs as they do with their leader male (Swedell 2002) and some of these relationships may be kin-based: despite male coercive takeovers (Swedell & Schreier 2009), **maternal relatives are found in OMUs more often than expected by chance** (Staedele et al. 2016).

female (kin) groups

- cooperative foraging
- cooperative breeding
- multiple pair bonds
- male protection



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