

EVOLUTION AND THE THEORY OF GAMES (Spring 2009)
EXERCISES 20 - 23

20. Show that the asymmetric War of Attrition (WoA) does not have an ESS.
21. Who takes care of the kids? Suppose a male has two possible strategies: he can be *faithful* and help the female with taking care of the offspring, or he can *philander* and abandon the female right after mating. A female also has two possible strategies: she can be *coy* by demanding a long courtship period before mating or she can be *fast* by skipping the courtship. Philandering males and coy females don't get along and do not mate, but other combinations of males and females do mate. The reward of producing offspring is v . The cost of rearing the offspring is $2c$, which is either shared by the parents if the male is faithful, or which is borne totally by the female otherwise. The cost of courtship is d to both the male and the female. Give the payoff matrix and analyze the game as an asymmetric game. Indicate in the $(d/c, v/c)$ parameter plane which strategy combinations are evolutionarily stable.
22. Solve the iterated Hawk-Dove game for the strategies *Bully* (B) and *Retaliator* (R). Remember, *Bully* plays H in the first round, and in all subsequent rounds does the opposite of what his opponent just did (i.e., responds with H to D and with D to H). *Retaliator*, on the other hand, starts with D in the first round, and in all subsequent rounds does the same as what his opponent just did (i.e., responds with D to D and with H to H).
23. Solve the iterated Prisoner's Dilemma for the strategies *all-D* and *all-C-and-twice-sucker-quits* (i.e., the *all-C* player quits the game after having been defected twice).