



Figure 1. Percentage of each group that were ranked 1 or 2 (■), 3 or 4 (▨), and 5 or 6 (□) in each of the three sets of trials. Sample sizes and mean ranks are given in parentheses.

relationships within pairs of individuals to be one-sided and stable.

To test whether the home pens had linear dominance hierarchies, we calculated Landau's (1951) index of linearity, h , for each group. In a perfectly linear hierarchy, h is equal to 1.0, and in a completely non-linear hierarchy, h is equal to

zero. With a group size of 10, a value for h of 0.52 or greater is required to conclude that the hierarchy is more linear than expected by chance alone ($P < 0.05$; Appleby 1983). In large groups (more than 10), it is not unusual for dominance hierarchies to contain non-linear elements (Wilson 1975).