

# Supporting Information:

## Social Feedback and the Emergence of Rank in Animal Society

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### S1 Text. Average Preferential Rank Aggression

Rather than quantify the total aggression in the system (Average Rank Aggression; see Eq. 3, main text), we can also measure individual-level preferences. We can quantify the average fraction of an individual's aggression that is directed  $\Delta$  steps away in the hierarchy by measuring  $R_{\text{pref}}(\Delta)$ , defined as

$$R_{\text{pref}}(\Delta) = \frac{1}{N_{\Delta}} \sum_{i=1}^N \frac{d_{i\Delta}}{d_i}, \quad (1)$$

where  $d_i$  is the total aggression seen for individual  $i$ . If  $R(2)$  is 0.1, for example, it means that, on average, an individual directs 10% of their aggression towards an individual two steps down in the hierarchy.