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

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

(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.