



**Figure S2. Effects of  $r$  on the distribution of the number of cooperators  $p(N_c)$ .**

This plot shows the analytical solutions from Eqs. (14) and (15) for  $N=100$  and  $\alpha=0.0001$ , with the value of  $p(N_c)$  indicated by the color. The distribution is

normalized as  $\sum_{N_c=0}^N p(N_c, r) = 1$  for each value of  $r$ .